

# **SPECIAL PROVISIONS & SUPPLEMENTAL SPECIFICATIONS**

CSI-Inch/Pound

Project No:	STP-3328(1)0
Name:	300 WEST; RIVERDALE ROAD TO 4400 SOUTH
	WIDENING
County:	WEBER
Bid Opening:	November 29, 2005
	Date

## **MANDATORY PRE-BID CONFERENCE**

Date: November 17, 2005

Time: 02:00 pm

Location: Mandatory Pre-Bid Conference will be  
November 17, 2005, 2:00 p.m.

4360 Parker Drive Riverdale, Utah 84405  
Riverdale City Community Center

**Conference attendance is a requirement for bid submission.**



**2005 - U.S. Standard Units (Inch-Pound Units)**    September 12, 2005

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## Federal Projects With Full Size Plan Sheets

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33.	Section	02926S	Invasive Weed Control
34.	Section	02969S	Optional Use of Reclaimed Asphalt Pavement
35.	Section	03300S	Cast-In-Place Concrete
36.	Section	13554M	Polymer Concrete Junction Box - Supplemental

**I. 2005 Standard Specifications**

The State of Utah Standard Specifications for Road and Bridge Construction, U.S. Standard Units (Inch Pound Units), Edition of 2005 applies on this project as a static Specification Book as well as all other applicable specification changes.

Refer to Part XIII (Special Provisions and Supplemental Specifications) for other project specific specifications.

## II. List of Revised Standard Drawings

### Change One

Revised February 24, 2005

AT 1	Legend Sheet	02/24/2005
AT 2	Ramp Meter Details	02/24/2005
AT 3	Ramp Meter Sign Panel	02/24/2005
AT 5	Ramp Meter Loop Installation	02/24/2005
AT 6	Conduit Details	02/24/2005
AT 7	Polymer-Concrete Junction Box Details	02/24/2005
AT 8	ATMS Cabinet	02/24/2005
AT 9	ATMS Cabinet Disconnect And Transformer Frame	02/24/2005
AT 10	CCTV Mounting Details	02/24/2005
AT 11	CCTV Pole Details	02/24/2005
AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	02/24/2005
AT 13	Deleted	N/A
AT 14	Weigh In Motion Piezo Details	02/24/2005
AT 15	RWIS Site And Foundation Details	02/24/2005
AT 16	RWIS Tower Base And Service Pad Layout	02/24/2005
AT 17	Ground Rod Installation And Tower Grounding	02/24/2005
AT 18	TMS Detection Zone Layout	02/24/2005
BA 3	Deleted	N/A
BA 3A	Cast In Place Constant Slope Barrier	02/24/2005
BA 3B	Precast Concrete Constant Slope Transition Section For Crash Cushion And W-Beam Guardrail	02/24/2005
BA 4B	W-Beam Guardrail Transition	02/24/2005
BA 4C	W-Beam Guardrail Transition Curb Section	02/24/2005
CC 7	Deleted	N/A
CC 7A	Grading And Installation Details Crash Cushion Type F Quad Trend 350	02/24/2005
CC 7B	Reserved For Future Use	N/A
CC 8	Deleted	N/A
CC 8A	Grading And Installation Details Crash Cushion Type G	02/24/2005
CC 8B	Grading And Installation Details For "3R" Projects Crash Cushion Type G	02/24/2005
CC 9A	Grading And Installation Details Crash Cushion Type H	02/24/2005
CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	02/24/2005
DD 4	Geometric Design for Freeways (Roadway)	02/24/2005
FG 3	Swing Gates Type I For Gates Less Than 17'	02/24/2005
ST 5	Painted Median And Auxiliary Lane Details	02/24/2005

## Federal Projects With Full Size Plan Sheets

### Change Two

Revised April 28, 2005

AT 4	Typical Ramp Meter Signal Head Mounting	04/28/2005
CB 1	Curb and Gutter Inlet	04/28/2005
CB 2	Open Curb Inlet	04/28/2005
CB 3	Shallow Catch Basin	04/28/2005
CC 8A	Grading And Installation Details Crash Cushion Type G	04/28/2005
CC 8B	Grading And Installation Details For "3R" Projects Crash Cushion Type G	04/28/2005
CC 9A	Grading And Installation Details Crash Cushion Type H	04/28/2005
CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	04/28/2005
DD 4	Geometric Design for Freeways (Roadway)	04/28/2005
FG 4	Deleted	N/A
FG 4A	Deer Crossing Details	04/28/2005
FG 4B	Deer Ramp Details	04/28/2005
SL 12	Traffic Counting Loop Detector Details	04/28/2005
SL 13	Video Detection Camera Mount	04/28/2005
SN 8	Ground Mounted Timber Sign Post (P1)	04/28/2005
SN 11	Slipbase Ground Mounted Tubular Steel Sign Post (P4)	04/28/2005

### Change Three

Revised June 30, 2005

CB 5A	Standard Catch Basin and Cleanout Box	06/30/2005
GW 5A	Pedestrian Access	06/30/2005
GW 5B	Pedestrian Access	06/30/2005
GW 5C	Pedestrian Access	06/30/2005

## Federal Projects With Full Size Plan Sheets

### Change Four

Revised August 25, 2005

BA 1B	Precast Concrete Full Barrier Standard Section	08/25/2005
BA 3B	Precast Concrete Constant Slope Transition Section	08/25/2005
	For Crash Cushion And W-Beam Guardrail	08/25/2005
BA 4B	W-Beam Guardrail Transition	08/25/2005
CC 7B	Crash Cushion Type F BEAT-SSCC	08/25/2005
DG 1	Fill Height for Metal Pipe (Steel)	08/25/2005
EN 1	Temporary Erosion Control (Check Dams)	08/25/2005
EN 2	Temporary Erosion Control (Silt Fence)	08/25/2005
EN 3	Temporary Erosion Control (Slope Drain And	
	Temporary Berm)	08/25/2005
EN 4	Temporary Erosion Control (Drop Inlet Barriers)	08/25/2005
EN 5	Temporary Erosion Control (Pipe Inlet And Curb	
	Inlet Barriers)	08/25/2005
EN 6	Temporary Erosion Control (Sediment Trap and	
	Stabilized Construction Entrance)	
EN 7	Temporary Erosion Control (Straw Bale Barrier)	08/25/2005
SL 14	Highway Luminaire Pole Ground Mount	08/25/2005
SL 15	Luminaire Slip Base Details	08/25/2005
SN 12A	Ground Mounted Sign Installation Details	08/25/2005

### **III. Materials Minimum Sampling and Testing**

**Follow the requirements of the Current Materials Minimum Sampling and Testing Manual:**

**Materials Minimum Sampling and Testing Manual reference can be found from the UDOT Web Site at:**

**<http://www.udot.utah.gov/index.php/m=c/tid=645>**





# NOTICE TO CONTRACTORS

Sealed proposals will be received by the Utah Department of Transportation UDOT/DPS Building (4th Floor), 4501 South 2700 West, Salt Lake City, Utah. 84114-8220, until 2 o'clock p.m. Tuesday, November 29, 2005, and at that time the download process of bids from the USERTrust Vault to UDOT will begin, with the public opening of bids scheduled at 2:30 for WIDENING of 300 WEST; RIVERDALE ROAD TO 4400 SOUTH in WEBER County, the same being identified as Federal Aid Project No: STP-3328(1)0.

## **Federal Regulations:**

In conformity with the Federal-Aid Highway Act of 1968, the U.S. Department of Labor has certified the minimum wage rates to be paid on this contract. These rates are made a part of the contract documents. This Department has been advised by the Wage and Hour Division, U.S. Department of Labor, that contractors engaged in highway construction work are required to meet the provisions of the Fair Labor Standards Act of 1938, (52 Stat. 1060). This contract is subject to all appropriate Federal Laws, including Title VI of the Civil Rights Act of 1964.

**Project Location:** 300 WEST; RIVERDALE ROAD TO 4400 SOUTH

## **The principal items of work are as follows (for all items of work see attachment):**

Roadway Excavation (Plan Quantity)  
HMA - 3/4 inch  
Traffic Control

**The project is to be completed:** in 273 Calendar Days.

**Mandatory Pre-bid Conference:** November 17, 2005, 02:00 pm, Mandatory Pre-Bid Conference will be  
November 17, 2005, 2:00 p.m.  
4360 Parker Drive Riverdale, Utah 84405  
Riverdale City Community Center

Conference attendance is a requirement for bid submission.

## **Other Requirements:**

All project bidding information, including Specifications and Plans, can be viewed, downloaded, and printed from UDOT's Project Development Construction Bid Opening Information website, <http://www.udot.utah.gov/index.php/m=c/tid=319>. To bid on UDOT projects, bidders must use UDOT's Electronic Bid System (EBS). The EBS software and EBS training schedules are also available on this website.

Project information can also be reviewed at the main office in Salt Lake City, its Region offices, and its District offices in Price, Richfield, and Cedar City.

Project Plans cannot be downloaded or printed from the website unless your company is registered with UDOT. Go to UDOT's website to register. Unregistered companies may obtain a **CD**, that contains the Specifications and Plans, from the main office, 4501 South 2700 West, Salt Lake City, (801) 965-4346, for a fee of \$20.00, plus tax and mail charge, if applicable, none of which will be refunded.

Prequalification of bidders is required. Prior to submitting a bid, the bidder must have on file with the Utah Department of Transportation a completed and approved contractor's application for prequalification. Department processing time is 10 working days from receipt of properly executed documentation.

As required, a contractor's license must be obtained from the Utah Department of Commerce.

Each bidder must submit an electronic bid bond from an approved surety company using UDOT's Electronic Bid System (EBS); or in lieu thereof, cash, certified check, or cashier's check for not less than 5% of the total amount of the bid, made payable to the Utah Department of Transportation, showing evidence of good faith and a guarantee that if awarded the contract, the bidder will execute the contract and furnish the contract bonds as required.

The right to reject any or all bids is reserved.

If you need an accommodation under the Americans with Disabilities Act, contact the Construction Division at (801) 965-4346. Please allow three working days.

Additional information may be secured at the office of the Utah Department of Transportation, (801) 965-4346.

**Dated this 29th day of October, 2005.**

**Revised Date:**

UTAH DEPARTMENT OF TRANSPORTATION  
John R. Njord, Director

# Utah Department of Transportation Bidder's Schedule

**Bid Opening Date:** 11/29/2005

**Project Number:** STP-3328(1)0

**Project Name:** 300 WEST; RIVERDALE ROAD TO 4400 SOUTH

**Concept:** WIDENING

**Funding:** FEDERAL

**Bid Items Version#:** 1

**DBE Goal:** 4.00%

**Region:** REGION 1

**County:** WEBER

#	Item	Description	Quantity	Unit
<b>10 - ROADWAY</b>				
Description: 01 - MOBILIZATION				
1	00830001U	Equal Opportunity Training	2000	hour
2	012850010	Mobilization	1	lump sum
3	015540005	Traffic Control	1	lump sum
<b>10 - ROADWAY</b>				
Description: 02 - ROADWAY REMOVAL				
4	02221001P	Remove Fire Hydrant	2	each
5	02221002P	Remove Water Meter	5	each
6	02221003P	Remove Water Valve	1	each
7	02221004P	Remove Land Drain Manhole	2	each
8	022210050	Remove Tree	34	each
9	02221005P	Remove Water Manhole	1	each
10	02221006P	Remove Sewer Manhole	3	each
11	02221007P	Remove Cleanout Box / Catch Basins	16	each
12	022210080	Remove Fence	1450	foot
13	02221008P	Remove Wall	1	lump sum
14	02221009P	Remove Waterline	820	foot
15	02221010P	Remove Sewer Pipe	490	foot
16	022210110	Remove Concrete Sidewalk	1050	square yard
17	022210115	Remove Concrete Driveway	440	square yard
18	02221011P	Remove Storm Drain Pipe	1300	foot
19	022210125	Remove Concrete Curb and Gutter	3450	foot
20	02221012P	Remove Concrete Waterway	260	foot
21	022210150	Remove Concrete Pavement	81	square yard
22	022210165	Remove Asphalt Pavement	19120	square yard
23	022260010	Remove Concrete Slope Protection	36	square yard
<b>10 - ROADWAY</b>				
Description: 03 - RELOCATION				
24	018910020	Move Mailbox	1	each
25	02221012P	Remove and Replace Rock Wall	1	lump sum
<b>10 - ROADWAY</b>				
Description: 04 - EARTHWORK				
26	020560005	Borrow (Plan Quantity)	7260	cubic yard
27	023160020	Roadway Excavation (Plan Quantity)	52200	cubic yard

\*Note: Item numbers ending with "" or "P" identify a change to the Standard Specification, Supplemental Specifications or Measurement and payment. Read all related documents carefully.

# Utah Department of Transportation Bidder's Schedule

**Bid Opening Date:** 11/29/2005

**Region:** REGION 1

**Project Number:** STP-3328(1)0

**County:** WEBER

**Project Name:** 300 WEST; RIVERDALE ROAD TO 4400 SOUTH

**Concept:** WIDENING

**Funding:** FEDERAL

**Bid Items Version#:** 1

**DBE Goal:**

#	Item	Description	Quantity	Unit
<b>10 - ROADWAY</b>				
Description: 05 - DUST CONTROL				
28	015720020	Dust Control and Watering	1160	1000 gallons

## 10 - ROADWAY

Description: 06 - CONCRETE

29	02056003P	Granular Backfill Borrow (for Concrete Surfaces)	3070	ton
30	02721005P	Untreated Base Course 3/4 inch Max (for Concrete Surfaces)	2890	ton
31	027710010	Concrete Curb Type B3	690	foot
32	027710025	Concrete Curb and Gutter Type B1	9750	foot
33	027710040	Concrete Driveway Flared, 6 inch Thick	3380	square foot
34	027710059	Pedestrian Access Ramp	6	each
35	027760015	Concrete Sidewalk	3930	square yard
36	02776001P	Park Strip Planter Box (w/o vegetation)	34	each
37	027760020	Concrete Median Filler	120	square foot
38	02776002P	Stamped Concrete	3670	square yard
39	027760040	Concrete Flatwork 6 inch thick	700	square foot

## 10 - ROADWAY

Description: 07 - SURFACING

40	02056004P	Granular Backfill Borrow (for Asphalt Surfaces)	18880	ton
41	02721006P	Untreated Base Course 3/4 inch Max (for Asphalt Surfaces)	10780	ton
42	02741006*	HMA - 3/4 inch	5790	ton
43	027480010	Liquid Asphalt MC-70 or MC-250	18	ton

## 10 - ROADWAY

Description: 08 - DRAINAGE

44	018920050	Reconstruct Manhole	4	each
45	026100426	18 inch Reinforced Concrete Pipe Culvert, Class C	3010	foot
46	02610042P	15 inch Reinforced Concrete Pipe Culvert, Class C	20	foot
47	026240010	Approach Slab Catch Basin	30	each
48	02635000*	10 inch Perforated PVC Land Drain with Gravel and Geotextile Wrap	560	foot
49	02635001*	Manhole (5-ft Storm Drain)	19	each

## 10 - ROADWAY

Description: 09 - WATER

50	020820010	Water Meter, Contractor Furnished	8	each
51	02812001*	3/4 inch Type-K Service Connection Lateral	230	foot
52	02812002*	1 inch Type-K Service Connection Lateral	21	foot
53	02812003*	1 - 1/2 inch Type-K Service Connection Lateral	22	foot
54	02812004*	1 inch PVC Waterline	5330	foot

\*Note: Item numbers ending with "\*" or "P" identify a change to the Standard Specification, Supplemental Specifications or Measurement and payment. Read all related documents carefully.

# Utah Department of Transportation Bidder's Schedule

**Bid Opening Date:** 11/29/2005

**Project Number:** STP-3328(1)0

**Project Name:** 300 WEST; RIVERDALE ROAD TO 4400 SOUTH

**Concept:** WIDENING

**Funding:** FEDERAL

**Region:** REGION 1

**County:** WEBER

**Bid Items Version#:** 1

**DBE Goal:**

#	Item	Description	Quantity	Unit
<b>10 - ROADWAY</b>				
Description: 09 - WATER				
55	02812005*	2 inch PVC Waterline	740	foot
56	02812006*	6 inch C-900 Pipe	160	foot
57	02812007*	Raise Valve Box	9	each
58	02812008*	8 inch C-900 Pipe	2520	foot
59	02812009*	4 inch Conduit Sleeve	660	foot
60	02812010*	Connect To Existing	4	each
61	02812011*	6 inch Gate Valve	2	each
62	02812012*	8 inch Gate Valve	6	each
63	02812013*	Fire Hydrant	9	each
64	02812014*	8 inch Tee	1	each
65	02812015*	8 inch Bend	1	each

## 10 - ROADWAY

Description: 10 - SANITARY SEWER

66	018920050	Reconstruct Manhole	6	each
67	02643001*	8 inch PVC Pipe	490	foot
68	02643002*	4 inch PVC Lateral	480	foot
69	02643003*	Sewer Connection	13	each
70	02643004*	Manhole (5-ft Sanitary Sewer)	4	each

## 10 - ROADWAY

Description: 11 - PAVEMENT MARKING

71	027650020	Pavement Message Paint	28	each
72	027650050	Pavement Marking Paint	25	gallon
73	027650070	Pavement Marking Paint (Stopbars, Crosswalks-12 inch)	14	each

## 20 - STRUCTURES

Description: 12 - MSE TYPE WALLS

74	02861001*	MSE Retaining Wall (3-ft)	570	square foot
75	02861002*	MSE Retaining Wall (4-ft)	40	square foot
76	02861003*	MSE Retaining Wall (5-ft)	670	square foot
77	02861004*	MSE Retaining Wall (6-ft)	920	square foot
78	02861005*	MSE Retaining Wall (7-ft)	1140	square foot
79	02861006*	MSE Retaining Wall (8-ft)	1420	square foot
80	02861007*	MSE Retaining Wall (9-ft)	8630	square foot
81	02861008*	MSE Retaining Wall (10-ft)	1600	square foot
82	02861009*	MSE Retaining and Traffic Load Bearing Wall (6-ft)	980	square foot
83	02861010*	MSE Retaining and Traffic Load Bearing Wall (7-ft)	1890	square foot
84	02861011*	MSE Retaining and Traffic Load Bearing Wall (8-ft)	350	square foot
85	02861012*	MSE Retaining and Traffic Load Bearing Wall (9-ft)	930	square foot

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**Project Number:** STP-3328(1)0

**Project Name:** 300 WEST; RIVERDALE ROAD TO 4400 SOUTH

**Concept:** WIDENING

**Funding:** FEDERAL

**Bid Items Version#:** 1

**DBE Goal:**

**Region:** REGION 1

**County:** WEBER

#	Item	Description	Quantity	Unit
<b>20 - STRUCTURES</b>				
Description: 12 - MSE TYPE WALLS				
86	02861013*	MSE Retaining and Traffic Load Bearing Wall (10-ft)	400	square foot
87	02861014*	MSE Retaining and Traffic Load Bearing Wall (11-ft)	430	square foot
88	02861015*	MSE Retaining and Traffic Load Bearing Wall (12-ft)	220	square foot
89	02861016*	MSE Retaining and Traffic Load Bearing Wall (13-ft)	250	square foot
90	02861017*	MSE Retaining and Traffic Load Bearing Wall (14-ft)	240	square foot
91	02861018*	MSE Retaining and Traffic Load Bearing Wall (15-ft)	280	square foot
<b>30 - LANDSCAPING</b>				
Description: 13 - FENCING AND GATE				
92	028210014	4 ft Chain Link Fence, Type II	100	foot
93	028210018	6 ft Chain Link Fence, Type II	140	foot
94	02821002*	6 ft Chain Link Fence, Type II with Vinyl Slats	430	foot
95	028210100	Chain Link Gate, H= 6 ft X W= 16 ft	1	each
<b>30 - LANDSCAPING</b>				
Description: 14 - LANDSCAPING				
96	02373006*	Type I Cobble (City picked color I)	760	cubic yard
97	02373007*	Type II Cobble (City Picked Color II)	630	cubic yard
98	02812001*	Design and Reconstruct Residential Irrigation System (Parcel 6)	1	lump sum
99	02812002*	Design and Reconstruct Residential Irrigation System (Parcel 5)	1	lump sum
100	02812003*	Pressurized Irrigation System	1	lump sum
101	029110010	Wood Fiber Mulch	1	acre
102	02912001P	Strip and Stockpile Topsoil (Plan Quantity)	140	cubic yard
103	02912002P	Spread Topsoil (Plan Quantity)	3050	square yard
104	029220010	Drill Seed	1	acre
105	029220060	Turf Sod	7050	square foot
106	029320030	Plant - No. 1 Container	340	each
107	029320050	Plant - No. 5 Container	440	each
108	02932015P	Junipers horizontalis 1.25 Cal Min (Creeping Juniper)	13	each
109	02932016P	Pyrus Chanticleer 1.25 Cal. Min (Flowering Pear )	51	each
110	029360010	Establishment Period	1	lump sum
<b>40 - SIGNING</b>				
Description: 15 - SIGNING				
111	028910005	Remove Sign	9	each
112	028910010	Relocate Sign	8	each
113	028910050	Sign Type A-I, 24 inch X 30 inch	3	each
114	028910060	Sign Type A-I, 30 inch X 30 inch	7	each
115	02891006P	Sign Type A-I, 24 inch X 48 inch	1	each

\*Note: Item numbers ending with "\*" or "P" identify a change to the Standard Specification, Supplemental Specifications or Measurement and payment. Read all related documents carefully.

# Utah Department of Transportation

## Bidder's Schedule

**Bid Opening Date:** 11/29/2005

**Region:** REGION 1

**Project Number:** STP-3328(1)0

**County:** WEBER

**Project Name:** 300 WEST; RIVERDALE ROAD TO 4400 SOUTH

**Concept:** WIDENING

**Funding:** FEDERAL

**Bid Items Version#:** 1

**DBE Goal:**

#	Item	Description	Quantity	Unit
<b>50 - SIGNALS</b>				
Description: 16 - SIGNAL SCHEDULE				
116	02892001D	Traffic Signal System 4400 S 300 West Washington Terrace	1	lump sum
117	028920020	Installation of State Furnished Material	1	lump sum
118	028920025	Installation of State Furnished Mast Arm Mounted Sign	1	each
119	02892005*	Removal and Salvage of Existing Equipment	1	lump sum
<b>60 - LIGHTING</b>				
Description: 17 - LIGHTING				
120	16135001P	Tray Cable, Conduit, Pole Ground Mounts & All Pertinent Materials	1	lump sum
121	16525001P	Enhanced Washington Postlite (WE250MHMCN3N4H S-64457)	35	each
122	16525002P	Cincinnati Cast Aluminum Crossarm for 2 Luminaires (CSC30CA/DGH)	12	each
123	16525003P	RH16S5/18CADGT (3X5) Transpo 4100 Breakaway Couplings/Skirt (green finish)	23	each

\*Note: Item numbers ending with "\*" or "P" identify a change to the Standard Specification, Supplemental Specifications or Measurement and payment. Read all related documents carefully.

## VI. Measurement and Payment

The Department will measure and pay for each bid item as detailed in this section. Payment is contingent upon acceptance by the Department.

Items are listed by Specification and in tables as follows:

Item #	Bid Item Number	Bid Item Name	Unit of Measurement and Payment
<b>Additional information goes here.</b>			

<b>1</b>	<b>0083001U</b>	<b>Equal Opportunity Training</b>	<b>Hour</b>
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<b>2</b>	<b>012850010</b>	<b>Mobilization</b>	<b>Lump</b>
	<b>Payment</b>	<b>Amount Paid</b>	<b>When Paid</b>
	First	The lesser of 25% of Mobilization or 2.5% of contract	With first estimate
	Second	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 5% of contract
	Third	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 10% of contract
	Fourth	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 20% of contract
	Final	Amount bid in excess of 10% of contract price.	Project Acceptance-Final

<b>3</b>	<b>015540005</b>	<b>Traffic Control</b>	<b>Lump</b>
Partial Payment: Based on the percentage of the project completed, excluding the cost of the traffic control.			

<b>4</b>	<b>02221001P</b>	<b>Remove Fire Hydrant</b>	<b>Each</b>
Includes all required earthwork including excavating, backfilling and compaction; removing and disposing of all piping, valves, fittings, thrust blocking, fire hydrant and all work required to shut off water supply lines and all appurtenant work, complete.			

<b>5</b>	<b>02221002P</b>	<b>Remove Water Meter</b>	<b>Each</b>
Includes all required earthwork including excavating, backfilling and compaction; removing and disposing of all piping, valves, fittings, thrust blocking, water meter and all work required to shut off water supply lines and all appurtenant work, complete.			

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<b>6</b>	<b>02221003P</b>	<b>Remove Water Valve</b>	<b>Each</b>
Includes all required earthwork including excavating, backfilling and compaction; removing and disposing of all piping, valves, fittings, thrust blocking and all work required to shut off water supply lines and all appurtenant work, complete.			
<b>7</b>	<b>02221004P</b>	<b>Remove Land Drain Manhole</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling and compaction; removing and disposing of all concrete manhole sections and all manhole components; capping and sealing all allocated pipes, removing and disposing of excess and unsuitable material; and all other appurtenant work, complete.			
<b>8</b>	<b>022210050</b>	<b>Remove Tree</b>	<b>Each</b>
Basis for Payment: Includes all related earthwork including excavating, backfilling, removing and compacting; cutting, removing and disposing of existing trees within the limits of construction. Sections and branches; removing and disposing of stumps and roots; and all other appurtenant work, complete.			
<b>9</b>	<b>02221005P</b>	<b>Remove Water Manhole</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling and compaction; removing and disposing of all concrete manhole sections and all manhole components; capping and sealing all allocated pipes, removing and disposing of excess and unsuitable material; and all other appurtenant work, complete.			
<b>10</b>	<b>02221006P</b>	<b>Remove Sewer Manhole</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling and compaction; removing and disposing of all concrete manhole sections and all manhole components; capping and sealing all allocated pipes, removing and disposing of excess and unsuitable material; and all other appurtenant work, complete.			
<b>11</b>	<b>02221007P</b>	<b>Remove Cleanout Box / Catch Basin</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling and compaction; removing and disposing of all concrete cleanout boxes or catch basins and all components; capping and sealing all allocated pipes, removing and disposing of excess and unsuitable material; and all other appurtenant work, complete.			
<b>12</b>	<b>022210080</b>	<b>Remove Fence</b>	<b>Feet</b>
Includes all required earthwork; removing fence posts, underground concrete or other support, fabric, gates and all other pertinent material; disposing of all said material in an acceptable manner; backfilling and smooth grading the work area to match the existing grades to the satisfaction of the Engineer and all appurtenant work, complete.			



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<b>13</b>	<b>02221008P</b>	<b>Remove Wall</b>	<b>Lump</b>
Basis for Payment: Includes all related earthwork including excavating, backfilling and compacting; cutting, removing and disposing of MSE wall to the satisfaction of the Engineer and the property owner. Completed slopes shall not be more than 2:1 and the remaining structure shall be structurally sound and retain original functionality.			
<b>14</b>	<b>02221009P</b>	<b>Remove Waterline</b>	<b>Feet</b>
Includes all required earthwork, including excavating, backfilling and compaction, removing and disposing of the existing water line and appurtenances as may be required and as directed; disposing of the pipe and all other appurtenances in an acceptable manner; and all appurtenant work, complete. Includes capping and sealing all abandoned pipes in an acceptable manner as required by the Engineer.			
<b>15</b>	<b>02221010P</b>	<b>Remove Sewer Pipe</b>	<b>Feet</b>
Includes all required earthwork, including excavating, backfilling and compaction, removing and disposing of the existing sewer pipe and appurtenances as may be required and as directed; disposing of the pipe; capping and sealing all abandoned pipes in an acceptable manner; and all appurtenant work, complete.			
<b>16</b>	<b>022210110</b>	<b>Remove Concrete Sidewalk</b>	<b>Square yard</b>
<p>A. Use the area of horizontal projection to compute the area of concrete.</p> <p>B. Includes all required earthwork, saw-cutting concrete sidewalk as required and as directed; breaking up and removing existing sidewalk complete and to the limits indicated and as required by the Engineer; disposing of the removed concrete debris in an acceptable manner; and all appurtenant work, complete.</p>			
<b>17</b>	<b>022210115</b>	<b>Remove Concrete Driveway</b>	<b>Square yard</b>
Includes all required earthwork, saw-cutting concrete driveway as required and as directed; breaking up and removing existing concrete driveway, including driveway approaches and sidewalk, complete, and to the limits indicated and as required by the Engineer; disposing of the removed concrete debris in an acceptable manner; and all appurtenant work, complete.			
<b>18</b>	<b>02221011P</b>	<b>Remove Storm Drain Pipe</b>	<b>Feet</b>
Includes all required earthwork, including excavating, backfilling and compaction, removing and disposing of the existing storm water piping (piping materials maybe concrete, plastic and or corrugated steel) in an acceptable manner, capping and sealing all abandoned pipes and all appurtenant work, complete.			

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<b>19</b>	<b>022210125</b>	<b>Remove Concrete Curb and Gutter</b>	<b>Feet</b>
Includes all related earthwork; saw-cutting existing curb and gutter, as required and as directed; breaking up and removing existing concrete curb and gutter, to the limits indicated and as required; disposing of the removed concrete debris in an acceptable manner; and all appurtenant work, complete.			
<b>20</b>	<b>02221012P</b>	<b>Remove Concrete Waterway</b>	<b>Feet</b>
Includes all related earthwork; saw-cutting as required and as directed; breaking up and removing existing concrete waterway, to the limits indicated and as required; disposing of the removed concrete debris in an acceptable manner; and all appurtenant work, complete.			
<b>21</b>	<b>022210150</b>	<b>Remove Concrete Pavement</b>	<b>Square yard</b>
<p>Regardless of the depth encountered.</p> <ul style="list-style-type: none"> <li>A. Do not measure discontinued roads within the limits of the new roadbed or roads that are disturbed in performing other items of work.</li> <li>B. Quantity measured and paid is excluded from measurement and payment under "Roadway Excavation".</li> <li>C. No payment will be made for concrete curb and concrete curb and gutter integral to the concrete pavement to be removed under "Remove Concrete Pavement."</li> <li>D. Includes all required earthwork, saw-cutting concrete flatwork as required an as directed; breaking up and removing existing concrete flatwork, including driveway approaches, handicap ramps and sidewalk, complete and to the limits indicated and as required by the Engineer; disposing of the removed concrete debris in an acceptable manner; an all appurtenant work, complete.</li> </ul>			
<b>22</b>	<b>022210165</b>	<b>Remove Asphalt Pavement</b>	<b>Square yard</b>
<p>Regardless of the depth encountered.</p> <ul style="list-style-type: none"> <li>A. Do not measure discontinued roads within the limits of the new roadbed or roads that are disturbed in performing other items of work.</li> <li>B. Quantity measured and paid is excluded from measurement and payment under "Roadway Excavation".</li> </ul>			
<b>23</b>	<b>022260010</b>	<b>Remove Concrete Slope Protection</b>	<b>Square yard</b>
Includes removal of concrete slope protection. Integrity of the existing concrete stairs will be protected and maintained during removal.			

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<b>24</b>	<b>018910020</b>	<b>Move Mailbox</b>	<b>Each</b>
Includes all work required to remove and / or repair mailbox and install and maintain a temporary mailbox during construction.			
<b>25</b>	<b>02221012P</b>	<b>Remove and Replace Rock Wall</b>	<b>Lump</b>
Includes all required earthwork, including excavating, backfilling and compaction, removing and replacing existing rock walls as required. Materials used shall be equal or better, includes all work required to protect and or replace all adjoining facilities / appurtenances, complete.			
<b>26</b>	<b>020560005</b>	<b>Borrow (Plan Quantity)</b>	<b>Cubic Yard</b>
Includes supplying borrow (if necessary), placing and compacting as directed by the Engineer; all related and all other appurtenant work, complete. Borrow imported will be measured and weight tickets will be used as a check for measurement, but will not be individually considered as evidence of placement. A factor based on the density of material used will be used for converting from tons to cubic yards measurements when weight tickets are used for checking quantities furnished. Borrow placed outside the limits, as directed herein, and as directed by the Engineer, shall be at the Contractor's expense; with no additional cost to the owner. All imported and onsite soils used for borrow must be in accordance to all recommendations found in the geotechnical study titled <b>"GEOTECHNICAL STUDY 300 WEST STREET IMPROVEMENT RIVERDALE, UTAH"</b> by Earthtec Testing & Engineering, P.C. November 2001.			
<b>27</b>	<b>023160020</b>	<b>Roadway Excavation (Plan Quantity)</b>	<b>Cubic yard</b>
Includes all related removal / exporting of waste material from the work site with disposal in an acceptable manner. Includes all waste materials not paid under other pay items; and all other appurtenant work, complete.			
<b>28</b>	<b>015720020</b>	<b>Dust Control and Watering</b>	<b>1000 Gallon</b>
Dust control will be made available at all times to adequately prevent dust from: A. Hindering driving conditions for through traffic. B. Prevent excessive dust from entering private or commercial property adjacent to the project.			

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<b>29</b>	<b>02056003P</b>	<b>Granular Backfill Borrow (for Concrete Surfaces)</b>	<b>Ton</b>
Includes supplying Granular backfill Borrow; fine grading and compacting, placing and compacting in accordance to the specifications and to the thickness indicated on the drawings and as directed, and all appurtenant work, complete. A. In final position. B. At abutments, Granular Backfill Borrow placed outside an area that is bound by vertical planes 3 feet inside the abutment backwall and 2 feet inside the wing walls will be at the Contractor's expense. C. No separate payment will be made for material placed outside the above limitation, but will include it on Other Items of Work.			
<b>30</b>	<b>02721005P</b>	<b>Untreated Base Course 3/4 inch Max (for Concrete Surfaces)</b>	<b>Ton</b>
Includes supplying material; find grading and compacting substrate surface; placing and compacting material to the thickness indicated and as directed; and all appurtenant work, complete.			
<b>31</b>	<b>027710010</b>	<b>Concrete Curb Type B3</b>	<b>Feet</b>
Measured along the roadway face. Includes excavation and untreated base course. Includes all required earthwork, to include excavating and grading for curb, backfilling around structure, and compacting backfill; furnishing, placing, and compacting roadbase, to the thicknesses indicated; constructing concrete curb, forming and finish wok at driveway approaches, including expansion joints and radius sections, of the size and to the limits indicated an as directed by the engineer.			
<b>32</b>	<b>027710025</b>	<b>Concrete Curb and Gutter Type B1</b>	<b>Feet</b>
Measured along the roadway face. Includes excavation and untreated base course. Includes all required earthwork, to include excavating and grading for curb and gutter, backfilling around structure, and compacting backfill; furnishing, placing, and compacting roadbase, to the thicknesses indicated; constructing concrete curb and gutter, forming and finish wok at driveway approaches, including expansion joints and radius sections, of the size and to the limits indicated an as directed by the engineer.			
<b>33</b>	<b>027710040</b>	<b>Concrete Driveway Flared, 6 inch Thick</b>	<b>Square Feet</b>
In place, include Radius and Flares. Includes excavation and untreated base course. Includes all required earthwork, to include excavating and grading for driveway approach, backfilling around pavement, and compacting backfill; furnishing, placing, and compacting gravel base, to the thickness indicated; constructing concrete driveway pavement, of the width and thickness, and to the limits indicated and as directed by the Engineer; and all appurtenant work.			

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<b>34</b>	<b>027710059</b>	<b>Pedestrian Access Ramp</b>	<b>Square Feet</b>
In place. Includes all related earthwork and forming; furnishing and installing roadbase; furnishing and installing concrete and appurtenances; and all other appurtenant work, complete.			
<b>35</b>	<b>027760015</b>	<b>Concrete Sidewalk</b>	<b>Square yard</b>
In place. Includes all related earthwork and forming; furnishing and installing roadbase; furnishing and installing concrete and appurtenances; and all other appurtenant work, complete.			
<b>36</b>	<b>02776001P</b>	<b>Park Strip Planter Box (w/o vegetation)</b>	<b>Each</b>
Each includes all form work, excavation, placement of 24 inches of sand loam topsoil, removal of all debris; and all appurtenant work as shown, complete.			
<b>37</b>	<b>027760020</b>	<b>Concrete Median Filler</b>	<b>Square feet</b>
In place. Includes excavation and untreated base course.			
<b>38</b>	<b>02776002P</b>	<b>Stamped Concrete</b>	<b>Square yard</b>
Includes all required earthwork, form work, excavating backfill, compaction and placing colored concrete with "cobble" stamping, power washing, concrete seal coating and all appurtenant work, complete. The exact color and pattern for the concrete and stamping pattern to be approved by Riverdale City prior to any work taking place.			
<b>39</b>	<b>027760040</b>	<b>Concrete Flatwork 6 inch thick</b>	<b>Square feet</b>
Includes excavation and untreated base course. Includes all required earthwork, to include excavating and grading for flatwork, backfilling around pavement, and compacting backfill; furnishing, placing, and compacting gravel base, to the thickness indicated; constructing flatwork, of the width and thickness, and to the limits indicated and as directed by the Engineer, and all appurtenant work complete.			
<b>40</b>	<b>02056004P</b>	<b>Granular Backfill Borrow (for Asphalt Surfaces)</b>	<b>Ton</b>
Includes supplying Granular backfill Borrow; fine grading and compacting, placing and compacting in accordance to the specifications and to the thickness indicated on the drawings and as directed, and all appurtenant work, complete.			
A. In final position.			
B. At abutments, Granular Backfill Borrow placed outside an area that is bound by vertical planes 3 feet inside the abutment backwall and 2 feet inside the wing walls will be at the Contractor's expense.			
C. No separate payment will be made for material placed outside the above limitation, but will include it on Other Items of Work.			

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<b>41</b>	<b>02721006P</b>	<b>Untreated Base Course 3/4 inch Max (for Asphalt Surfaces)</b>	<b>Ton</b>
Includes supplying base course material; fine grading and compacting base course material, placing and compacting in accordance to the specifications the material to the thickness indicated on the drawing and as directed, and all appurtenant work, complete.			
<b>42</b>	<b>02741006*</b>	<b>HMA - 3/4 inch</b>	<b>Ton</b>
Includes aggregates, asphalt binder, hydrated lime, other additives, and Tack Oil. No separate payment will be made for asphalt binder, hydrated lime, additives.			
Includes all asphalt as defined under the plans and shown in the specification as defined as: "4 1/2" ASPHALTIC CONCRETE REQ'D", "1 - 1/2" THICK ASPHALTIC CONCRETE OVERLAY REQ'D" as shown on drawings TS-1 through TS-8, and "3" ASPHALT REQUIRED FOR PARKING LOT" as shown on DT-4. Includes all areas described as "RECONSTRUCT PAVEMENT SECTION", "ASPHALT CONCRETE DRIVEWAY REQ'D" and "1 - 1/2" ASPHALTIC CONCRETE OVERLAY REQ'D" as shown on drawings RD-1 through RD-9. Includes all handwork and any additional work required for placement within these items complete.			
<b>43</b>	<b>027480010</b>	<b>Liquid Asphalt MC-70 or MC-250</b>	<b>Ton</b>
Shape the surface to the required grade and section. Keep the surface free from ruts, corrugations, or other irregularities. Clean the surface of all materials that prevent bonding to the existing surface (e.g. mud, dirt, leaves, etc.)			
<b>44</b>	<b>018920050</b>	<b>Reconstruct Manhole</b>	<b>Each</b>
In place. The finish concrete elevation shall be between 1/4 inch and 3/8 inch below the finished asphalt surface. The new concrete collar work shall be protected from traffic for a minimum of 7 days from the time the concrete is installed. Payment shall include all traffic control devices required. Traffic control devices must be lighted at night and checked and maintained daily.			
<b>45</b>	<b>026100426</b>	<b>18 inch Reinforced Concrete Pipe Culvert, Class C</b>	<b>Feet</b>
Includes all related earthwork; excavating trenches to the required elevations; compacting material in trenches including pipe bedding and trench backfill; dewatering as required; furnishing and installing reinforced concrete pipe. Include all costs of testing the pipelines as described herein, and as directed by the Engineer. The contractor will be required to inspect the interior of all storm drain lines by video television recording in the presence of the Engineer. The video tape recording shall be delivered to the Engineer upon completion (for approval). All reinforced concrete pipe shall be class IV pipe, includes all other appurtenant work, complete.			

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<b>46</b>	<b>02610043P</b>	<b>15 inch Reinforced Concrete Pipe Culvert, Class C</b>	<b>Feet</b>
Includes all related earthwork; excavating trenches to the required elevations; compacting material in trenches including pipe bedding and trench backfill; dewatering as required; furnishing and installing reinforced concrete pipe. Include all costs of testing the pipelines as described herein, and as directed by the Engineer. The contractor will be required to inspect the interior of all storm drain lines by video television recording in the presence of the Engineer. The video tape recording shall be delivered to the Engineer upon completion (for approval). All reinforced concrete pipe shall be class IV pipe, includes all other appurtenant work, complete.			

<b>47</b>	<b>026240010</b>	<b>Approach Slab Catch Basin</b>	<b>Each</b>
Includes costs for all related earthwork; removing and disposing of curb and gutter sections; furnishing and installing gravel and backfill material as required;			

<b>48</b>	<b>02635000*</b>	<b>10 inch Perforated PVC Land Drain with Gravel and Geotextile Wrap</b>	<b>Feet</b>
Includes. furnishing and installation of 10-inch diameter perforated pvc pipe, approved non-woven filter fabric, ¾-inch drain rock, and all required fittings, materials, labor, tools, and equipment to complete the required work and insure proper alignment and elevation. Excavating trenches to the required elevations; removing excess and unsuitable material from the site and disposing of material in an acceptable manner; backfilling trenches in pipe zone where need be; compacting backfill material in the pipe zone; includes hand trimming excavation and all appurtenant work, complete, and as directed by the Engineer. Contractor to expect an existing French Drain along the alignment of the Land Drain. Existing French Drain will tie into the Land Drain where intersection point is found and as directed by the Engineer.			

<b>49</b>	<b>02635001*</b>	<b>Manhole (5-ft Storm Drain)</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling and compacting; furnishing and installing concrete, rebar, and precast concrete manhole sections as required; furnishing and installing steps in manhole as required; connecting all pipes and sealing pipe connections; grouting, furnishing and placing rock bedding for the base, furnishing and installing new manhole ring and lid; constructing concrete collar at road surface; and all other appurtenant work, complete.			

<b>50</b>	<b>020820010</b>	<b>Water Meter, Contractor Furnished</b>	<b>Each</b>
Water meter shall be placed in accordance to city specifications and standards and as directed by the Engineer.			

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<b>51</b>	<b>02812001*</b>	<b>3/4 inch Type K Service Connection Lateral</b>	<b>Feet</b>
Includes all related earthwork including excavating, dewatering as required, backfilling and compacting; furnishing and installing ¾ inch diameter copper water service line for new water main to new or existing water meter; furnishing and installing new copper water service piping from water meter to 1 foot beyond back of sidewalk and connecting to existing service line with compression fitting installed new corporation stop and fillings as required; removing and disposing of old water service lateral piping; disconnecting existing water service lateral if required; and all other appurtenant work, complete.			

<b>52</b>	<b>02812002*</b>	<b>1 inch Type K Service Connection Lateral</b>	<b>Feet</b>
Includes all related earthwork including excavating, dewatering as required, backfilling and compacting; furnishing and installing 1 inch diameter copper water service line for new water main to new or existing water meter; furnishing and installing new copper water service piping from water meter to 1 foot beyond back of sidewalk and connecting to existing service line with compression fitting installed new corporation stop and fillings as required; removing and disposing of old water service lateral piping; disconnecting existing water service lateral if required; and all other appurtenant work, complete.			

<b>53</b>	<b>02812003*</b>	<b>1 - ½ inch Type K Service Connection Lateral</b>	<b>Feet</b>
Includes all related earthwork including excavating, dewatering as required, backfilling and compacting; furnishing and installing 1-½ inch diameter copper water service line for new water main to new or existing water meter; furnishing and installing new copper water service piping from water meter to 1 foot beyond back of sidewalk and connecting to existing service line with compression fitting installed new corporation stop and fillings as required; removing and disposing of old water service lateral piping; disconnecting existing water service lateral if required; and all other appurtenant work, complete.			

<b>54</b>	<b>02812004*</b>	<b>1 inch PVC Waterline</b>	<b>Feet</b>
Includes all related earthwork, excavating trenches to the required depths; compacting materials in trenches, furnishing and installing pvc piping, class 200 pipe, including pipe bedding and trench backfill; dewatering as required; all fitting and accessories and all other appurtenant work, complete.			

<b>55</b>	<b>02812005*</b>	<b>2 inch PVC Waterline</b>	<b>Feet</b>
Includes all related earthwork, excavating trenches to the required depths; compacting materials in trenches, furnishing and installing pvc piping, class 200 pipe, including pipe bedding and trench backfill; dewatering as required; all fitting and accessories and all other appurtenant work, complete.			



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<b>56</b>	<b>02812006*</b>	<b>6 inch C-900 Pipe</b>	<b>Feet</b>
Includes excavating trenches to the required elevations; stockpiling material if it is to be re-used and placing stockpiled material in trenches if it is to be re-used; compacting material in trenches including pipe bedding and trench backfill; dewatering as required; furnishing and installing C-900 Class 200 waterline pipe, fittings, location detector tape, location wire, and appurtenances; pressure testing of new waterline; chlorinating and disinfecting new waterline with flushing of piping; grading the surface of excavations; an all other appurtenant work complete.			
<b>57</b>	<b>02812007*</b>	<b>Raise Valve Box</b>	<b>Each</b>
Includes all related earthwork; removing and disposing of existing surfacing material; furnishing, placing and finishing concrete for collars as indicated and all appurtenant work. The finish concrete elevation shall be between ¼” and 3/8” below the finished asphalt surface. The new concrete collar work shall be protected from traffic for a minimum of 7 days from the time the concrete is installed. Payment shall include all traffic control devices required. Traffic control devices must be lighted at night and checked and maintained daily.			
<b>58</b>	<b>02812008*</b>	<b>8 inch C-900 Pipe</b>	<b>Feet</b>
Includes excavating trenches to the required elevations; stockpiling material if it is to be re-used and placing stockpiled material in trenches if it is to be re-used; compacting material in trenches including pipe bedding and trench backfill; dewatering as required; furnishing and installing C-900 Class 200 waterline pipe, fittings, location detector tape, location wire, and appurtenances; pressure testing of new waterline; chlorinating and disinfecting new waterline with flushing of piping; grading the surface of excavations; an all other appurtenant work complete.			
<b>59</b>	<b>02812009*</b>	<b>4 inch Conduit Sleeve</b>	<b>Feet</b>
Includes all related earthwork, excavating trenches to the required depths; compacting materials in trenches, furnishing and installing pvc piping, class 200 pipe, including pipe bedding and trench backfill; dewatering as required; all fitting and accessories and all other appurtenant work, complete.			
<b>60</b>	<b>02812010*</b>	<b>Connect To Existing</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling, and compacting; locating existing pipes; saw-cutting pipes as required; furnishing and installing all associated piping, pipe fittings (bends, tees, crosses, sleeves, and reducers), mega-lug fittings and concrete thrust blocks; disconnecting waterlines and fittings as required; capping and abandoning waterlines as required; and all other appurtenant work complete.			

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<b>61</b>	<b>02812011*</b>	<b>6 inch Gate Valve</b>	<b>Each</b>
Includes Excavating, backfilling and compacting; removing and installing pipe sections as required for valve installation; furnishing and installing gate valve, valve box, valve box concrete collar, mega-lug fittings and concrete thrust blocks; and all other appurtenant work, complete.			
<b>62</b>	<b>02812012*</b>	<b>8 inch Gate Valve</b>	<b>Each</b>
Includes Excavating, backfilling and compacting; removing and installing pipe sections as required for valve installation; furnishing and installing gate valve, valve box, valve box concrete collar, mega-lug fittings and concrete thrust blocks; and all other appurtenant work, complete.			
<b>63</b>	<b>02812013*</b>	<b>Fire Hydrant</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling, compacting and grading; furnishing and installing fire hydrant, 6-inch diameter piping from mainline to fire hydrant, 6-inch gate valve, valve box, concrete collar for valve box, mega-lug fittings, concrete thrust blocks and all required appurtenances; connecting 6-inch supply line to new or existing water line with appropriate fittings; and all appurtenant work, complete.			
<b>64</b>	<b>02812014*</b>	<b>8 inch Tee</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling, and compacting; locating existing pipes; saw-cutting pipes as required; furnishing and installing all associated piping, pipe fittings (bends, tees, crosses, sleeves, and reducers), mega-lug fittings and concrete thrust blocks; disconnecting waterlines and fittings as required; capping and abandoning waterlines as required; and all other appurtenant work complete.			
<b>65</b>	<b>02812015*</b>	<b>8 inch Bend</b>	<b>Each</b>
Includes all related earthwork including excavating, backfilling, and compacting; locating existing pipes; saw-cutting pipes as required; furnishing and installing all associated piping, pipe fittings (bends, tees, crosses, sleeves, and reducers), mega-lug fittings and concrete thrust blocks; disconnecting waterlines and fittings as required; capping and abandoning waterlines as required; and all other appurtenant work complete.			
<b>66</b>	<b>018920050</b>	<b>Reconstruct Manhole</b>	<b>Each</b>
In place. The finish concrete elevation shall be between ¼ inch and 3/8 inch below the finished asphalt surface. The new concrete collar work shall be protected from traffic for a minimum of 7 days from the time the concrete is installed. Payment shall include all traffic control devices required. Traffic control devices must be lighted at night and checked and maintained daily.			

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<b>67</b>	<b>02643001*</b>	<b>8 inch PVC Pipe</b>	<b>Feet</b>
<p>Includes furnishing and installation of pvc sewer pipe (ASTM 3034, SDR35) and all required fittings, materials, labor, tools, and equipment to complete the required work and insure proper alignment and elevation. Excavating trenches to the required elevations; removing excess and unsuitable material from the site and disposing of material in an acceptable manner; backfilling trenches in pipe zones and backfilling trenches above pipe zone to the required elevations; compacting backfill material inn and above the pipe zone; includes hand trimming excavation and all appurtenant work, complete and as directed by the Engineer.</p> <p>Payment shall also include the costs of providing facilities to divert any existing flow of sanitary sewer water around work areas, as required; maintaining flow of diverted water until the new pipe lines have been completed, including testing; and the removal of the diversion facilities after the work is completed.</p> <p>Payment shall include all costs of testing sewer pipelines as described herein, and as directed by the Engineer. The contractor will be required to inspect the interior of all sewer lines by video television recording in the presence of the Engineer. The video tape recording shall be delivered to the Engineer upon completion. The contractor shall be required to perform a low-pressure air test as described in the sanitary sewer special provision technical specification. The test must be conducted in the presence of the Engineer.</p>			

<b>68</b>	<b>02643002*</b>	<b>4 inch PVC Lateral</b>	<b>Feet</b>
<p>Includes furnishing and installation of pvc sewer pipe (ASTM 3034, SDR35) and all required fittings, materials, labor, tools, and equipment to complete the required work and insure proper alignment and elevation. Excavating trenches to the required elevations; removing excess and unsuitable material from the site and disposing of material in an acceptable manner; backfilling trenches in pipe zones and backfilling trenches above pipe zone to the required elevations; compacting backfill material inn and above the pipe zone; includes hand trimming excavation and all appurtenant work, complete and as directed by the Engineer.</p> <p>Payment shall also include the costs of providing facilities to divert any existing flow of sanitary sewer water around work areas, as required; maintaining flow of diverted water until the new pipe lines have been completed, including testing; and the removal of the diversion facilities after the work is completed.</p> <p>Payment shall include all costs of testing sewer pipelines as described herein, and as directed by the Engineer. The contractor will be required to inspect the interior of all sewer lines by video television recording in the presence of the Engineer. The video tape recording shall be delivered to the Engineer upon completion. The contractor shall be required to perform a low-pressure air test as described in the sanitary sewer special provision technical specification. The test must be conducted in the presence of the Engineer.</p>			

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<b>69</b>	<b>02643003*</b>	<b>Sewer Connection</b>	<b>Each</b>
<p>Includes all required earthwork; disconnecting existing sewer lateral from existing sanitary sewer line and cutting lateral pipe, as indicated and as directed; removing and disposing of a small section of existing lateral pipe; furnishing and installing wye fittings, as required; connecting new 4-inch pvc lateral pipe to the new wye branch on the new sanitary sewer line and connecting the new lateral 4-inch pvc lateral pipe to the end of the existing sewer lateral pipe with the appropriate type coupling; and all appurtenant work.</p> <p>Payment shall also include costs for providing temporary facilities to divert the existing flow of sewage around areas of construction, as required; maintaining flow of diverted sewage until connection of new sewer pipe has been completed, and removal of diversion facilities after the work is completed.</p>			

<b>70</b>	<b>02643004*</b>	<b>Manhole (5-ft Sanitary Sewer)</b>	<b>Each</b>
<p>Basis of Payment: Includes all required earthwork; constructing new manhole, as indicated, including precast riser sections, manhole steps, precast eccentric cone section, cast iron ring and cover, and all appurtenances; forming and sealing pipe inlets, outlets and channels; constructing concrete base and furnishing and placing rock bedding for the base and all appurtenant work, complete.</p>			

<b>71</b>	<b>027650020</b>	<b>Pavement Message Paint</b>	<b>Each</b>
<p><b>In place, measurement - Painted Pavement Messages:</b></p> <ul style="list-style-type: none"> <li>A. Letter = one message</li> <li>B. Arrow = one message</li> <li>C. Multi-headed arrow = one message per arrow</li> <li>D. School crossbars = one message per 24 inch x 10 ft bar</li> <li>E. Crosswalk = two message per lane and two messages per shoulder</li> <li>F. Stop Bar = one message per lane and one message per shoulder</li> <li>G. Railroad crossing markings = seven messages per lane <ul style="list-style-type: none"> <li>1. 'R' = one message each (two required)</li> <li>2. 'X' = two messages</li> <li>3. Transverse Bar = one message each (two required)</li> <li>4. Stop Bar = one message</li> </ul> </li> </ul> <p><b>Payment:</b></p> <ul style="list-style-type: none"> <li>A. No payment will be made for removal of unauthorized, smeared, or damaged markings.</li> </ul>			

<b>72</b>	<b>027650050</b>	<b>Pavement Marking Paint</b>	<b>Gallon</b>
<p>No payment will be made for removal of unauthorized, smeared, or damaged markings.</p>			

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<b>73</b>	<b>027650070</b>	<b>Pavement Marking Paint (Stop bars, Crosswalks - 12 inch)</b>	<b>Each</b>
In place, for each lane or shoulder by the 12 inch wide line painted, per ST series Standard Drawings.			

<b>74</b>	<b>02861001*</b>	<b>MSE Retaining Wall (3-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

<b>75</b>	<b>02861002*</b>	<b>MSE Retaining Wall (4-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

<b>76</b>	<b>02861003*</b>	<b>MSE Retaining Wall (5-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

<b>77</b>	<b>02861004*</b>	<b>MSE Retaining Wall (6-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

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<b>78</b>	<b>02861005*</b>	<b>MSE Retaining Wall (7-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			
<b>79</b>	<b>02861006*</b>	<b>MSE Retaining Wall (8-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			
<b>80</b>	<b>02861007*</b>	<b>MSE Retaining Wall (9-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			
<b>81</b>	<b>02861008*</b>	<b>MSE Retaining Wall (10-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

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82	02861009*	MSE Retaining and Traffic Load Bearing Wall (6-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

83	02861010*	MSE Retaining and Traffic Load Bearing Wall (7-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

84	02861011*	MSE Retaining and Traffic Load Bearing Wall (8-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

85	02861012*	MSE Retaining and Traffic Load Bearing Wall (9-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

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86	02861013*	MSE Retaining and Traffic Load Bearing Wall (10-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

87	02861014*	MSE Retaining and Traffic Load Bearing Wall (11-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

88	02861015*	MSE Retaining and Traffic Load Bearing Wall (12-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			

89	02861016*	MSE Retaining and Traffic Load Bearing Wall (13-ft)	Square Feet
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			



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<b>90</b>	<b>02861017*</b>	<b>MSE Retaining and Traffic Load Bearing Wall (14-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			
<b>91</b>	<b>02861018*</b>	<b>MSE Retaining and Traffic Load Bearing Wall (15-ft)</b>	<b>Square Feet</b>
<b>Per Square Foot Installed. Three Options Available:</b> <ol style="list-style-type: none"> <li>Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)</li> <li>Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)</li> <li>Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)</li> </ol>			
<b>92</b>	<b>028210014</b>	<b>4 ft Chain Link Fence, Type II</b>	<b>Feet</b>
Includes all require earthwork, construction of the new chain link fencing as located and indicated, including hot dip galvanized posts, 9-gauge fabric (barb knuckle salvage), 9- gauge tension wire complete with ties and hog rings, concrete.			
<b>93</b>	<b>028210018</b>	<b>6 ft Chain Link Fence, Type II</b>	<b>Feet</b>
Includes all require earthwork, construction of the new chain link fencing as located and indicated, including hot dip galvanized posts, 9-gauge fabric (barb knuckle salvage), 9- gauge tension wire complete with ties and hog rings, concrete.			
<b>94</b>	<b>02821002*</b>	<b>6 ft Chain Link Fence, Type II with Vinyl Slats</b>	<b>Feet</b>
Includes all require earthwork, construction of the new chain link fencing as located and indicated, including hot dip galvanized posts, 9-gauge fabric (barb knuckle salvage), 9- gauge tension wire complete with ties and hog rings, concrete.			
Payment also includes furnishing and installing vinyl slats (poles hollow rib vinyl – color by owner) the fencing fabric.			
<b>95</b>	<b>028210100</b>	<b>Chain Link Gate, H=6 ft W=16 ft</b>	<b>Each</b>
In place <ol style="list-style-type: none"> <li>Double gates will be counted as two gates.</li> <li>Include barbed wire arms on gates.</li> </ol>			

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<b>96</b>	<b>02373006*</b>	<b>Type I Cobble (City picked color I)</b>	<b>Cubic Yard</b>
Weight tickets will be used as a check for measurement, but will not be individually considered as evidence of placement. A factor based on the density of material used will be used for converting from tons to cubic yards measurements when weight tickets are used for checking quantities furnished.			
<b>97</b>	<b>02373007*</b>	<b>Type II Cobble (City Picked Color II)</b>	<b>Cubic Yard</b>
Weight tickets will be used as a check for measurement, but will not be individually considered as evidence of placement. A factor based on the density of material used will be used for converting from tons to cubic yards measurements when weight tickets are used for checking quantities furnished.			
<b>98</b>	<b>02812001*</b>	<b>Design and Reconstruct Residential Irrigation System (Parcel 6)</b>	<b>Lump Sum</b>
Includes costs for all related earthwork including trenching, excavating, backfilling and compacting; disconnecting existing irrigation line; salvaging valves and returning them to the city; removing existing valve boxes and backfilling excavations; furnishing and installing all required piping, fittings, valves, sprinkler heads, wiring, irrigation boxes, gravel, sprinkler controller and all other appurtenant items to make system functional; connecting new sprinkler system to existing water supply; and all other appurtenant items, complete.			
<b>99</b>	<b>02812002*</b>	<b>Design and Reconstruct Residential Irrigation System (Parcel 5)</b>	<b>Lump Sum</b>
Includes costs for all related earthwork including trenching, excavating, backfilling and compacting; disconnecting existing irrigation line; salvaging valves and returning them to the city; removing existing valve boxes and backfilling excavations; furnishing and installing all required piping, fittings, valves, sprinkler heads, wiring, irrigation boxes, gravel, sprinkler controller and all other appurtenant items to make system functional; connecting new sprinkler system to existing water supply; and all other appurtenant items			
<b>100</b>	<b>02812003*</b>	<b>Pressurized Irrigation Systems (2)</b>	<b>Lump Sum</b>
Include all materials and workmanship to provide two complete and fully operational pressurized irrigation systems as outlined in the Modified Specification <b>02812M</b> ; one will service landscaping features of Riverdale City and one will service the City of Washington Terrace complete. Irrigation systems within each city will be separate and independent.			
<b>101</b>	<b>029110010</b>	<b>Wood Fiber Mulch</b>	<b>Acre</b>
Includes all related earthwork; removing and disposing of unsuitable protruding material, surface grading and placement of material to produce a smooth surface once mulch is placed.			

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<b>102</b>	<b>02912001P</b>	<b>Strip and Stockpile Topsoil (Plan Quantity)</b>	<b>Cubic Yard</b>
Includes all related earthwork; removing and stockpiling material as required; placing topsoil in areas as approved by the Engineer in a manner so as not to disturb existing trees, shrubs or environmentally sensitive areas complete. Contractor will be responsible for maintenance of stockpiled topsoil to prevent excessive composting "smell" by working stockpiles to add oxygen or other methods approved by the Engineer.			
<b>103</b>	<b>02912002P</b>	<b>Spread Topsoil (Plan Quantity)</b>	<b>Square Yard</b>
Includes furnishing, installing and grading topsoil; initial watering; resorting all lawn sod adjacent to curb and gutters, sidewalks, driveways, etc; protecting existing appurtenances such as sprinklers, lawn decorations, fences and landscaping items, or replacing all damaged items; and all other appurtenant work complete.			
<b>104</b>	<b>029220010</b>	<b>Drill Seed</b>	<b>Acre</b>
Includes supplying seed; preparing seedbed; placing seed, where indicated and as directed by the Engineer; and all appurtenant work. Seed placed outside the limits as indicated and as directed shall be at the Contractor's expense; with no additional cost to the Owner.			
<b>105</b>	<b>029220060</b>	<b>Turf Sod</b>	<b>Square Feet</b>
Includes grading to match existing sod boundaries and promote smoothness; final weed removal before supplying and placing Turf Sod. Turf Sod will only be paid to the limits shown on the drawings unless directed by the Engineer. Turf Sod placed outside the limits of shown will not be paid for.			
<b>106</b>	<b>029320030</b>	<b>Plant - No. 1 Container</b>	<b>Each</b>
Bark Mulch shall be placed throughout the plant grouping.			
<b>107</b>	<b>029320050</b>	<b>Plant - No. 5 Container</b>	<b>Each</b>
All shrubs shall have a three foot diameter area at their base.			
<b>108</b>	<b>02932015P</b>	<b>Junipers horizontalis 1.25 Cal Min (Creeping Juniper)</b>	<b>Each</b>
<b>109</b>	<b>02932016P</b>	<b>Pyrus Chanticleer 1.25 Cal. Min (Flowering Pear )</b>	<b>Each</b>
<b>110</b>	<b>029360010</b>	<b>Establishment Period</b>	<b>Lump Sum</b>

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<b>111</b>	<b>028910005</b>	<b>Remove Sign</b>	<b>Each</b>
Includes removal of foundations to a minimum of 6 inches below the ground line and backfilling; disposing of the sign in an acceptable manor, complete.			
<b>112</b>	<b>028910010</b>	<b>Relocate Sign</b>	<b>Each</b>
Includes cost of all related earthwork; removing the existing street sign, as required; placing the signs in temporary locations during project construction period, as directed; reinstalling the signs in their new locations, where and as directed; and all appurtenant work, complete. All relocated signs shall be inspected and approved by the engineer for reusability. Signs inadvertently damaged by the contractor will be replaced at no additional cost to the owner.			
<b>113</b>	<b>028910050</b>	<b>Sign Type A-1, 24 inch X 30 inch</b>	<b>Each</b>
Includes establishing proper elevation and orientation of all signs, structures, and determine proper sign post lengths as dictated by construction slopes; covering signs that require temporary covering with an opaque material, securing at the rear of the sign so that the sign is not damaged, maintain covering until removed; and constructing sign post foundations with concrete conforming to the indicated dimensions.			
<b>114</b>	<b>028910060</b>	<b>Sign Type A-1, 30 inch X 30 inch</b>	<b>Each</b>
Includes establishing proper elevation and orientation of all signs, structures, and determine proper sign post lengths as dictated by construction slopes; covering signs that require temporary covering with an opaque material, securing at the rear of the sign so that the sign is not damaged, maintain covering until removed; and constructing sign post foundations with concrete conforming to the indicated dimensions.			
<b>115</b>	<b>02891006P</b>	<b>Sign Type A-I, 24 inch X 48 inch</b>	<b>Each</b>
Includes establishing proper elevation and orientation of all signs, structures, and determine proper sign post lengths as dictated by construction slopes; covering signs that require temporary covering with an opaque material, securing at the rear of the sign so that the sign is not damaged, maintain covering until removed; and constructing sign post foundations with concrete conforming to the indicated dimensions.			
<b>116</b>	<b>02892001D</b>	<b>Traffic Signal System 4400 South 300 West, Washington Terrace</b>	<b>Lump</b>
<b>117</b>	<b>028920020</b>	<b>Installation of State Furnished Material</b>	<b>Lump</b>
<b>118</b>	<b>028920025</b>	<b>Installation of State Furnished Mast Arm Mounted Sign</b>	<b>Each</b>
<b>119</b>	<b>02892005*</b>	<b>Removal and Salvage of Existing Equipment</b>	<b>Lump</b>

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<b>120</b>	<b>16135001P</b>	<b>Tray Cable, Conduit, Pole Ground Mounts &amp; All Pertinent Materials</b>	<b>Lump</b>
Includes furnishing and installing all pull boxes complete; pole ground mounts complete; 2 inch PVC Schedule 40 conduit with nylon pull cord between each box for future cable (for stringing) complete. Installation shall be in accordance with the manufacturer's recommendations and the Engineer, the guidelines of Utah Power and Light, and shall be of such design to fit with items listed in pay items 121, 122 and 123. Light pole installation to the mounts and hookup by others.			
<b>121</b>	<b>16525001P</b>	<b>Enhanced Washington Postlite (WE250MHMCN3N4H S-64457) (green finish)</b>	<b>Each</b>
Contractor to purchase Product and store at Riverdale City's storage area as per manufacturer's recommendations and per Engineer's direction. Installation by others. All intended purchases will be submitted to the Engineer for review before the actual purchase is made.			
<b>122</b>	<b>16525002P</b>	<b>Cincinnati Cast Aluminum Crossarm for 2 Luminaires (CSC30CA/DGH)</b>	<b>Each</b>
Contractor to purchase product and store at Riverdale City's storage area as per manufacturer's recommendations and per Engineer's direction. Installation by others. All intended purchases will be submitted to the Engineer for review before the actual purchase is made.			
<b>123</b>	<b>16525003P</b>	<b>RH16S5/18CADGT (3X5) posts including Transpo 4100 Breakaway Couplings/Skirt (green finish)</b>	<b>Each</b>
Contractor to purchase Product and store at Riverdale City's storage area as per manufacturer's recommendations and per Engineer's direction. Installation by others.			

**VII. Use of Minority or Women Owned Banks**

**SPECIAL PROVISION**

**In the spirit of Federal Department of Transportation regulations the Utah Department of Transportation encourages all contractors and suppliers to thoroughly investigate the services offered by banks controlled and/or owned by minorities or women and to utilize their services as deemed feasible.**

**VIII. Bid Conditions**  
**DISADVANTAGED BUSINESS ENTERPRISE (DBE)**

**POLICY**

**“Policy Statement”**

It is the policy of the DEPARTMENT to take all necessary and reasonable actions to ensure that DBEs as defined herein shall have equal opportunity to participate in the performance of contracts financed in whole or in part with US Department of Transportation (DOT) funds under this agreement as modified herein.

**“Objectives”**

The objectives of this policy are to:

1. Ensure nondiscrimination in the award and administration of DOT assisted contracts;
2. Create a level playing field on which DBEs can compete fairly for DOT assisted contracts;
3. Ensure that the DBE program is narrowly tailored in accordance with applicable law;
4. Ensure that only firms that fully meet *49 CFR 26* eligibility standards are permitted to participate as DBEs;
5. Remove barriers to the participation of DBEs in Federal aid contracts;
6. Assist the development of firms that can compete successfully in the marketplace outside the DBE program; and
7. Provide appropriate flexibility in establishing and providing opportunities for DBEs.

**“Responsibilities”**

Implementation of the DBE Program is accorded the same priority as compliance with all other legal obligations incurred by the DEPARTMENT in financial assistance agreements with DOT.

1. The Civil Rights Manager shall be the DBE liaison officer, who shall have direct, independent access to the Executive Director concerning DBE program matters. The Civil Rights manager shall be responsible for implementing all aspects of the DBE program. Adequate staff will be assigned to administer the DBE program.

2. The ENGINEER is responsible for supervision of the DBE participation covered by the Contract.

### **DBE BID AND PERFORMANCE CONDITIONS**

#### **“Obligations”**

The contractor, subcontractor, service provider, or supplier at any lower tier shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the DEPARTMENT deems appropriate.

#### **“Assurances”**

Each contract between the DEPARTMENT and the Contractor and each subcontract at any lower tier must include the following assurance:

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the DEPARTMENT deems appropriate.

#### **A. CONTRACT GOAL**

1. The DEPARTMENT has determined that one or more can reasonably be expected to compete for the work contained in the proposal for this project. It is, therefore, the goal of the DEPARTMENT that DBE firms shall have an affirmative action opportunity to contract for the following percentage of work under this contract:
  - a. If the indicated DBE percent of the *CONTRACT DBE GOAL* is greater than 0.0 percent, complete Part A of the DBE BID ASSURANCE. Refer to Bidding Requirements, Section D, Subsection 1,a, of this Special Provision. (The commitment dollar amount up to the amount of the assigned goal is Race Conscious DBE participation. Any commitment dollar amount in excess of the assigned goal is Race Neutral Participation.)



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- b. If the indicated DBE percent of the *CONTRACT DBE GOAL* is 0.0 percent complete Part B of the DBE BID ASSURANCE. Refer to Bidding Requirements, Section D, Subsection 1,b, of this Special Provision. (Any commitment to a DBE is Race Neutral Participation.)

**CONTRACT DBE GOAL:** 4.0 **Percent**

### 2. GOALS

#### a. GOAL FOR BID EVALUATION

The above entered DBE percentage is a goal for bid evaluation to determine responsiveness of the proposal as it relates to this specification. Percentages for bidding purposes shall be calculated using dollar values and quantities as shown in proposals received for this project. Bidders shall compute the percentage of their DBE commitment by dividing the dollar amount of subcontract work that is being committed to certified DBE firms by the total dollar amount of the proposal. This will be the percentage of their DBE commitment to be used by the Electronic Bidding System (EBS) software.

#### b. RACE CONSCIOUS GOAL

DBE participation on projects that are assigned a Goal for Bid Evaluation that is greater than 0.0 percent is *race conscious* and the DBE commitment becomes a contract specification upon award. The Bidder must submit with its Bid Proposal a *DBE Commitment*, prepared within the EBS software, that indicates:

- (1) Name of DBE firm
- (2) Work items to be performed
- (3) Total dollar amount of commitment

If the DBE commitment does not meet or exceed the assigned goal, the Bidder must submit with the Bid Proposal documentation of good faith efforts.

c. RACE NEUTRAL GOAL

DBE participation on projects that are assigned 0.0 percent Goal for Bid Evaluation is *race neutral* and does not become a contract specification upon award. The Bidder must take equal opportunity action to allow DBEs to compete for and perform on subcontracts. Only work classifications that the Bidder will subcontract need to be considered in evaluating equal opportunity action in the bid preparation. Contacts that have been made with DBE firms regarding potential work to be subcontracted and the results of such contacts are to be submitted with the EBS prepared Bid Proposal in *Race Neutral DBE Documentation* which contains:

- (1) The work classifications that will be subcontracted.
- (2) DBE firms contacted.
- (3) Result of contact
- (4) Name of anticipated DBE subcontractor(s)
- (5) Anticipated work items to be performed by DBEs.
- (6) Anticipated dollar amount of subcontract(s).

NOTE: In the EBS (Electronic Bidding System):

Use the Quote Comparison to document item (1).

Use the DBE Contact Log to document items (2) and (3).

Use the DBE Commitment to document items (4), (5), and (6).

The *Race Neutral DBE Documentation* is required to document equal opportunity action and to assist UDOT with DBE reporting and DBE goal setting. Use the EBS functions in above NOTE as the Race Neutral DBE Documentation.

d. GOAL FOR CONTRACT PERFORMANCE

The Bidder's *DBE Commitment* becomes an attachment to the Bid Proposal and is a condition of award, and thereby becomes a contract specification. Upon award, this Race Conscious DBE Commitment also becomes the minimum goal for contract performance.

Commitments to DBEs that exceed the Goal for Bid Evaluation will be considered as both race conscious and race neutral. The dollar amount of the Goal for Bid Evaluation will be considered to be race conscious participation. Any dollar amounts in excess of the Goal for Bid Evaluation will be considered as race neutral participation.

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It is the intent of this Special Provision that the DBE Firm(s) listed for *race conscious* participation, as a minimum level of participation, will perform to the extent indicated in the Bidder's DBE Commitment. The minimum level of DBE participation includes:

- (1) Indicated DBE firm(s),
- (2) Indicated work item(s) (bid items),
- (3) Indicated total dollar amounts.

Listed bid items shall be considered to be committed in their entirety unless Bidders designate otherwise in their DBE Commitment. If the DBE will perform only a part of the bid item, i.e., haul only, the Bidder must indicate what part the DBE will perform (Partial Performance). If the DBE will perform only a part of the quantity of the bid item, the Bidder must indicate the estimated quantity of the work to be performed by the DBE (Partial Quantity).

*Substitutions of DBE subcontractor(s), work item(s), or decreases of total dollar amount(s)* as indicated in the Bidder's DBE Commitment will not be allowed without prior submission of written justification to the ENGINEER and approval of the ENGINEER and the Civil Rights Manager.

After award of a contract, substitutions will not be allowed without prior submission of a written "hold harmless" statement from the DBE.

Any change by the Contractor in the DBE Commitment requires that the change is approved by a Change Order.

Substitution of race neutral participation in excess of the Goal for Bid Evaluation requires equal opportunity efforts to substitute with other DBE participation.

*DEPARTMENT generated decreases due to quantity changes in individual bid items do not require prior approval of the Civil Rights Manager—but must be fully justified by the ENGINEER at the conclusion of the project in the Explanation of Overruns and Under-runs Statement. The ENGINEER’S justification shall show the total estimated quantity, the final pay quantity as shown on the final estimate invoice, the quantity of the under-run, and the percent of under-run of the individual item. The explanation for the under-run shall include the reasons for the under-run and shall include as much detail as possible.*

e. GOAL FOR FINAL COMPLIANCE

Percentages for final compliance shall be based on actual payments to DBEs. Over-runs and under-runs in individual contract items may require adjustments in the predetermined DBE percentage for a project if those items were not related to DBE performance. “The predetermined percentage for a project” refers to the percentage of the Contractor's DBE Commitment that becomes a contract specification upon award.

B. DEFINITIONS

For the purpose of this Special Provision, the following terms are defined:

1. Contract means a legally binding relationship obligating a seller to furnish supplies or services including but not limited to, construction and professional services) and the buyer to pay for them.
2. Contractor means one who participates, through a contract or subcontract (at any tier).
3. Disadvantaged Business Enterprise or DBE means a for profit small business concern.
  - a. That has been certified to DBE status by the UUCP.
  - b. That is at least 51 per cent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 per cent of the stock of which is owned by one or more such individuals; and
  - c. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.
  - d. Whose size is limited to average annual gross receipts of \$17,425,000 over the previous three fiscal years. The Secretary of Transportation may adjust this amount from time to time for inflation.

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OR

Whose size is limited to the current SBA Business size standard(s) found in 23 CFR part 121 appropriate to the type(s) of work the firm seeks to perform in DOT-assisted contracts.

4. DBE Goals mean:

- a. UDOT's annual overall goal on DOT-assisted projects for Federal fiscal year
- b. 2005 is 8.9 percent. 3.9 percent of the overall goal is a race neutral goal and reflects the level of DBE participation that would be expected absent the effects of discrimination. There is an implied DBE goal on projects with no goals (0.0 percent) that have subcontracting opportunities. The implied goal is the percent achievable by equal opportunity efforts.
- c. 5.0 percent of the goal is a race conscious goal and reflects the level of DBE participation that will be achieved in response to assigned DBE goals.

5. DBE Joint Venture means an association of a DBE firm and one or more other firms to carry out a single, for profit business enterprise, for which the parties combine their property, capital, efforts, skills, and knowledge, and in which the DBE is responsible for a distinct, clearly defined portion of the work of the contract and whose share in the capital contribution, control, management, risks, and profits of the joint venture to a degree commensurate with its ownership interest.

The DEPARTMENT's Civil Rights Office prior to bid opening must approve a DBE joint venture in order to be utilized for the satisfaction of contract DBE goals. A DBE Joint Venture application must be submitted allowing ample lead-time for the Civil Rights Office to review, evaluate, and verify information provided for in the application. An interview of the applicant may be necessary at the discretion of the DEPARTMENT prior to approval of the application. If an interview is deemed necessary it will be scheduled at the convenience of all parties.

6. Equal Opportunity Action requires individuals to be considered on the basis of individual capacities and not on the basis of any characteristics generally attributed to the group.

If a bidder requests or accepts bids for subcontract work, the bidder will request and accept bids from DBEs in the work classifications that potentially will be subcontracted.

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7. Good Faith Efforts means efforts to achieve a DBE goal or other requirements of this part that by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirements.
8. Lack of Financial Fitness is a performance-based definition based solely on failure to pay promptly. There is no reference to financial status or financial capability.
9. Prompt Payment means payment made no later than ten (10) work days after receipt of payment by the Contractor or Subcontractor, Service Provider or Supplier at any lower tier.
10. Race Conscious measure or program is focused specifically on assisting only DBEs, including women-owned DBEs. UDOT must establish contract goals to meet any portion of its overall DBE goal that it does not project being able to meet using race neutral means. To ensure that the DBE program continues to be narrowly tailored to overcome the effects of discrimination, UDOT must adjust the use of contract goals as follows:
  - a. If during the course of any year it is determined that the overall goal will be exceeded, UDOT will reduce or eliminate the use contract goals to the extent necessary to ensure that the use of contract goals does not result in exceeding the overall goal.
  - b. If it is determined that UDOT will fall short of its overall goal, then appropriate modifications in the use of race neutral and/or race conscious measures will be made to allow UDOT to meet the overall goal.
11. Race Neutral measure or program is one that is, or can be, used to assist all small businesses. UDOT must meet the maximum feasible portion of its overall DBE goal by using race -neutral means of facilitating DBE participation. Race neutral DBE participation includes:
  - a. Any time a DBE wins a prime contract through customary competitive procurement procedures,
  - b. Is awarded a subcontract on a prime contract that does not carry a DBE goal,
  - c. Is awarded a subcontract from a prime contractor that did not consider its DBE status in making the award even if there is a DBE goal.For the purposes of this part, race-neutral includes gender-neutrality.

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12. Regular Employee is a person who:
- a. Would be working for the DBE firm on any other subcontract with any other contractor.
  - b. Is a permanent employee of the DBE firm
- Or
- Has been recruited through the traditional recruitment and/or employment centers
- c. Has not recently been employed by the prime contractor on the present project, another subcontractor on the present project, or the renter-lessor of equipment being used on the present project.
  - d. Is not a member of a construction crew that regularly works for a non-DBE.
  - e. Is not a licensed contractor who is at the time “unemployed” or “between jobs.”
13. Regular Equipment is owned or leased and operated on a long term agreement and not on an *ad hoc* or contract by contract agreement.
- a. The equipment would be used by the DBE firm on any other subcontract with any other contractor.
  - b. The equipment would be owned by the DBE firm.
- Or
- The equipment would be leased/rented from traditional equipment lease/rental sources.
- c. The DBE firm would have a rental/lease agreement for any rented or leased equipment.
  - d. The equipment cannot belong to:
    - (1.) Prime Contractor
    - (2.) Another subcontractor on the present project.
    - (3.) Supplier of materials being installed by the DBE firm.
  - e. The equipment cannot come from another contractor fully operated.

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### 14. Reasonable Bid

This is a bid the DEPARTMENT would accept if it were the only bid submitted. Generally, this is a bid within 10 percent of the Engineer's Estimate.

### 15. Responsible Bidder

A responsible bidder has the apparent ability and capacity to perform the contract requirements.

In addition to normal prequalification, a responsible bidder is defined as one who has signed (manually or electronically) and submitted with the bid the DBE Bid Conditions Assurance of good faith effort included as Part I of this Special Provision certifying the intention to meet the DBE goal of a proposed contract or to continue good faith effort to do so. These goals may be met by subcontracting or leasing contracts with a DBE or purchasing material from a DBE insofar as the work or material becomes a part of a proposed contract.

### 16. Responsive Bidder

- a. A responsive bidder is a bidder who unequivocally offers to provide services or supplies in conformity with the material terms of the solicitation. In addition to normal prequalification and other bidding requirements, a responsive bidder in relationship to this Special Provision is defined as one who submits evidence of proposed subcontract performance with certified DBE firms to achieve the required dollar amount necessary to achieve the percentage goal.
- b. Bidders may be considered as presumptively responsive if they have failed to satisfy the advertised DBE goal set for the proposed contract but have certified in their bid that good faith efforts have been expended to meet the goal and that they will continue during the performance of the contract to locate, solicit, and involve DBE firms in contract performance. Documentation of the bidder's good faith efforts must be included with the bid package of the DEPARTMENT's review and assessment. Failure to do so shall render the bid non-responsive. The DEPARTMENT will reject the bid.

### 17. Satisfactory Completion of a subcontract occurs when:

- a. The subcontractor has satisfactorily completed in all respects the work under the Contract.
- b. The Contractor and the subcontractor have notified the ENGINEER in writing that the work of the subcontractor has been completed.



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- c. The Engineer will be given a reasonable length of time to check quantities if necessary. Checking quantities does not guarantee the absolute correctness of quantities.
  - d. The Contractor and the subcontractor have satisfactorily executed and delivered to the ENGINEER all documents, certificates and proofs of compliance required by the Contract. The satisfactory execution and delivery of these documents, certificates and proofs of compliance to the ENGINEER is a material requirement of the contract.
  - e. The ENGINEER accepts in writing the work of the subcontract.
  - f. Satisfactory Completion refers only to payment of retainage and accrued interest. A determination of Satisfactory Completion and payment in full for work performed does not relieve the contractor nor the subcontractor from any contractual obligation.
18. Satisfactory Performance means work performed and materials furnished in conformity with the plans and specifications.
19. Service Provider means a broker or a middle man. A business person who buys, sells or performs a service for another in exchange for a mark up or commission.
20. Socially and Economically Disadvantaged Individuals means any individual who is a citizen (or lawful admitted permanent resident) of the United States and who is:
- a. Any individual who the DEPARTMENT finds to be a socially and economically disadvantaged individual on a case-by-case basis.
  - b. Any individual in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:
    - (1) “Black Americans,” which includes persons having origins in any of the black racial groups of Africa;
    - (2) “Hispanic Americans,” which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American or other Spanish or Portuguese culture or origin, regardless of race;
    - (3) “Native Americans,” which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;

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- (4) “Asian-Pacific Americans,” which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands, (Republic of Palau), the Commonwealth of the Northern Mariana Islands, Macao, Fiji, Tonga, Kiribati, Juvalu, Nauru, Federated States of Micronesia, or Hong Kong;
- (5) “Subcontinent Asian Americans,” which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka.
- (6) Women.
- (7) Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

### 21. Subcontractor

A subcontracting arrangement is generally considered to exist when a person or firm assumes an obligation to perform a part of the contract work and the following conditions are present.

- a. The person or firm performing the work is particularly experienced and equipped for such work.
- b. Compensation is related to the amount of work accomplished rather than being on an hourly basis.
- c. Choice of work methods, except as restricted by the specifications, and the furnishing and controlling of labor and equipment are exercised by the subcontractor with only general supervision being executed by the prime contractor.
- d. Personnel involved in the operation are under the direct supervision of the subcontractor and are included on the subcontractor's payroll.

All conditions involved shall be considered and no one condition alone will normally determine whether a subcontract actually exists. In all cases, a DBE subcontractor must be an independent organization, and the ownership and control by the socially and economically disadvantaged individual(s) must be real and continuing. The prime contractor, a subcontractor, or a supplier shall not be responsible for the various operating and management activities of a DBE firm.

22. Supplier

Provides or furnishes materials, goods or services that may be incorporated into the project. The supply transaction is to be documented by an appropriate purchase agreement that includes the required provisions for Federal-aid construction projects.

23. UUCP The Utah Unified Certification Program (UUCP) provides “one-stop shopping” to applicants for DBE certification, such that an applicant is required to apply only once for a DBE certification that is honored by all recipients of Federal-aid Funds in the State of Utah.

C. DETERMINATION OF DBE CONTRACTOR’S ELIGIBILITY BY UUCP

1. Any Contractor may apply to the UUCP for status as a DBE. Applications shall be made on forms provided by the UUCP, entitled “UNIFORM CERTIFICATION APPLICATION” or “Information for Determining DBE Joint Venture Eligibility,” Form No. R-817. Application need not be made in connection with a particular bid. Only work contracted to certified DBE prime contractors or subcontractor to firms that have applied for and have been granted status as a DBE by the UUCP shall be considered toward contract goals as established in Subsection A.
2. It shall be the Contractor’s responsibility to submit a DBE application so that the UUCP has time to review it. The UUCP will review applications in a timely manner but is not committed to approve DBE status within any given period of time. The UUCP must have ample lead time to review, evaluate, and verify information provided with a application.
3. The DEPARTMENT shall maintain a UUCP Unified DBE Directory of DBE Contractors, vendors, service providers and suppliers that is updated as changes occur for the purpose of providing a reference source to assist any bidder in meeting the requirements of this bid condition. Bidders must use the most current DBE information available on the web site when submitting bids. A current UUCP DBE directory representing certified DBE Contractors is available through the UDOT Civil Rights Office, and also on the Internet at (click on this link):

<http://www.udot.utah.gov/index.php?m=c&tid=198>

An electronic file of the UUCP DBE Directory is available for downloading to use in the Electronic Bidding System (EBS) at the following URL (click on this link):

<http://www.udot.utah.gov/index.php/m=c/tid=317>

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4. In meeting the requirements of this bid condition, bidders are in no way limited to the DBE Directory referred to in 3 above in seeking out and negotiating with the DBE Contractors and determining which items of work shall be subcontracted to DBE Contractors. Bidders shall exercise their own judgments in selecting any subcontractor to perform any portion of the work.

The UUCP prior to bid opening must grant DBE status to any DBE Contractor or DBE Joint Ventures. DBE credit will not be allowed toward *race conscious* goals for a firm or joint venture that has not been DBE certified by the UUCP.

### D. BIDDING REQUIREMENTS

All bidders must satisfy the bidding requirements of this part. A DBE prime contractor's performance does not count toward fulfilling the DBE goal. A prime bidder who is a DBE contractor shall meet the DBE goal by using DBE subcontractors or by using good faith efforts.

1. DBE Bid Assurance
  - a. Race Conscious Goal

For a bid with a DBE goal greater than 0.0 percent to be considered responsive, *Part A* of the DBE Bid Assurance must be completed and included in the BID PROPOSAL, certifying that they will meet or exceed the Goal for Bid Evaluation established in Subsection A, or that they fail to meet the goal but have and will put forth good faith effort to meet or exceed the goal of the DBE program. *The EBS software based upon the entry of the DBE Commitment and/or the Good Faith Documentation into EBS will complete part A of the DBE Bid Assurance.* In either event, the Contractor shall continue efforts to consider and utilize DBE firms during the performance of the contract.
  - b. Race Neutral Goal

For a bid with a DBE goal of 0.0 percent to be considered responsive, *Part B* of the DBE Bid Assurance must be included in the BID PROPOSAL certifying that the Bidder has utilized equal opportunity action to allow DBE's to compete for and perform on subcontracts. *Part B* of the DBE Bid Assurance will be completed based upon the following information entered into EBS:

    - (1) Bids with no subcontracting opportunities

Bidders who intend to do all the work with their own organization will indicate this in EBS on the Bid Submission Checklist and Forms window. EBS will subsequently indicate on Part B of the DBE Bid Assurance that the Bidder does not intend to sublet a portion of the contract work.

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After the award of the bid, in the event that a Contractor indicates that he does not intend to sublet any work and subsequently determines to sublet a portion of the work, the Contractor:

- (a) must justify why subcontract quotes were not a part of the Bid Proposal,
- (b) must utilize equal opportunity action to allow DBEs to compete for and perform on the work to be sublet,
- (c.) must submit the required Race Neutral Documentation with the proposed subcontract.

NOTE: The Contractor may use the 'DBE Contact Log' and 'Quote Comparison' functions in EBS to develop the above requirements for documentation.

- (2.) Bids with subcontracting opportunities  
Race Neutral measure or program is one that is, or can be, used to assist all small businesses. UDOT must meet the maximum feasible portion of its overall DBE goal by using race -neutral means of facilitating DBE participation.

Bidders who solicit non-DBE subcontract quotes will utilize equal opportunity action to allow DBEs to compete for and perform on subcontracts. If the Bidder has selected 'Intend to Sublet' on the 'Bid Submission Checklist and Forms' window in the EBS software, Part B of the DBE Bid Assurance will indicate that the Bidder intends to sublet a portion of the contract work.

The results of the equal opportunity actions will be included with the EBS prepared Bid Proposal as a *Race Neutral Documentation*. Part B of the Bid Assurance Form will indicate the existence of any of the following types of Race Neutral Documentation that the Bidder has entered into EBS:

- (a) DBE Commitment
- (b) DBE Contact Log
- (c) Quote Comparison

In either event, the Contractor shall continue efforts to consider and utilize DBE firms during the performance of the contract.

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### 2. DBE Commitment

For a bid to be considered responsive, Bidders shall submit the following information regarding DBE compliance with the EBS prepared Bid Proposal:

Submit a DBE Commitment of work that will be subcontracted to certified DBE firm(s) as listed in the UUCP's Directory or DBE firms that have been approved by the UUCP prior to bid opening.

- a. The names of DBE firms that will participate in the contract;
- b. A specific description of the work each named DBE firm will perform (list specific bid items). Listed bid items shall be considered to be committed in their entirety unless Bidders designate otherwise in their DBE Commitment.
  - (1.) If mobilization is a bid item that is partially committed to a DBE, indicate the dollar amount of the DBE mobilization.
  - (2.) If a partial quantity is committed to a DBE, indicate the quantity committed to the DBE.
  - (3.) If a partial performance of an item is committed to a DBE, explain what part of the item the DBE will perform;
- c. The dollar amount of participation by each named DBE firm;
- d. If the contract goal is not met, evidence of good faith efforts.

The DBE Commitment is to be included in the bid prepared within, and said information will be kept confidential and will not be reviewed unless the Contractor is otherwise determined to be the low Bidder or the DEPARTMENT elects to review said information in making its determination as to award of the contract.

### 3. Race Neutral Commitment

For a bid to be considered responsive, Bidders shall submit the following information regarding equal opportunity compliance with their EBS prepared Bid Proposal:

Submit a Race Neutral DBE Commitment of work that will be subcontracted to certified DBE firm(s) as listed in UUCP DBE\_Directory or DBE firms that have been approved by the DEPARTMENT prior to bid opening. The DBE Commitment will include:

- a. The bid item(s) or work classification(s) that will be subcontracted;

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- b. The DBE firms that have been contacted. A reasonable number of DBEs available to perform the anticipated subcontract work must be contacted. The DBE firms must be given a reasonable amount of time to develop subcontract quotes.
- c. The results of the contacts with the DBE firms
- d. Name(s) of anticipated DBE subcontractor(s)
- e. Anticipated work items to be performed by DBE(s)
- f. Anticipated dollar amount of subcontract(s).

A specific description of the work each named DBE firm will perform (list specific bid items). Listed bid items shall be considered to be committed in their entirety unless Contractors designate otherwise in their DBE commitment.

- (1.) If mobilization is a bid item that is partially committed to a DBE, indicate the dollar amount of the DBE mobilization.
- (2.) If a partial quantity is committed to a DBE, indicate the quantity committed to the DBE.
- (3.) If a partial performance of an item is committed to a DBE, explain what part of the item the DBE will perform;

NOTE: In the EBS (Electronic Bidding System):

Use the quote comparison to document item (a)

Use the contact log to document items (b) and (c).

Use the DBE commitment to document items (d), (e), and (f).

The *Race Neutral Documentation* submitted in the EBS prepared bid, will be kept confidential and not reviewed unless the Contractor is otherwise determined to be the low Bidder or the DEPARTMENT elects to review said information in making their determination as to award of the contract.

#### 4. DBE Written Confirmation

Low Bidder shall submit to the Director of Construction & Materials within three (3) work days after the bid opening written confirmation from each DBE that it is participating in the contract as provided in the Prime Contractor's DBE Commitment or Race Neutral Documentation. The written confirmation shall include the following information:

- a. A description of the work that will be performed (list specific bid items). Listed bid items shall be considered to be committed in their entirety unless Contractors designate otherwise in their DBE commitment.

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- (1) If mobilization is a bid item that is partially committed, please confirm the dollar amount of the mobilization to be performed.
- (2) If a partial quantity is committed, confirm the quantity to be performed.
- (3) If a partial performance of an item is committed, confirm what part of the item will be performed.
- (4) Unit bid prices for each bid item that is committed to a DBE.
- (5) Total dollar amounts (mathematical extensions) for each bid item that is committed to a DBE

b. The dollar amount of participation by each named DBE firm.

### 5. Good Faith Efforts

Bidders who fail to meet the DBE goal for bid evaluation must demonstrate with documentary evidence that they made good faith efforts to do so. Bidders are required to include the Good Faith Efforts Documentation with the EBS prepared Bid Proposal. The said information will be kept confidential and not reviewed unless the Bidder is otherwise determined to be the low Bidder or UDOT and authorized representatives elect to review said information in making their determination as to award of the contract. For the bid to be considered responsive, Bidders shall include with the BID PROPOSAL specific documentary evidence that good faith efforts have been made to meet the goal.

Attached hereto and marked Exhibit A, and by this reference made a part hereof, is a list of actions that may be used to prove the kinds of efforts prospective Bidders should consider in their attempts to demonstrate good faith efforts. The list of actions, as contained in Exhibit A, is not intended to be an exclusive list of efforts that a prospective Bidder may wish to consider in demonstrating good faith efforts to satisfy DBE participation requirements. The determination of good faith efforts shall be based upon the information and documentation of the actions supplied by the Bidder with the bid proposal. The DEPARTMENT reserves the right to investigate and verify such information or to request the low dollar Bidder to clarify information submitted at the time of bid.

### 6. Award of the Contract

The award of the contract, if awarded, will be made to the apparent successful responsive, responsible Bidder who submitted a reasonable bid for the contract and has complied with this Subsection D.



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### 7. Administrative Reconsideration

Good faith efforts as used herein shall be determined on a case by case basis. If it is determined that the apparent low Bidder has failed to meet the requirements of Exhibit A, the bidder will be provided an opportunity for administrative reconsideration.

- a. Official(s) who did not take part in the original determination will perform the administrative reconsideration..
- b. The Bidder will have the opportunity to provide to written documentation or argument concerning the issue of whether it met the goal or made adequate good faith efforts to do so.
- c. The Bidder will have the opportunity to meet in person with the reconsideration official to discuss the issue of whether it met the goal or made adequate good faith efforts to do so.
- d. The Bidder will be notified in writing of the decision and the basis for the decision.
- e. The reconsideration decision is administratively final and is not appealable to FHWA nor to the DOT.

### E. COUNTING DBE PARTICIPATION TOWARD GOALS FOR BID EVALUATION

1. The DEPARTMENT will recognize and grant DBE credit toward the goal for bid evaluation (*race conscious* goals) for work committed to DBE subcontractors ONLY in the types of work for which DBE certification has been granted by the UUCP prior to bid opening. It is necessary that all bidders refer to the UUCP DBE Directory for direction and guidance. A current copy of the DBE directory is available through the Civil Rights Office and on the Internet at (click on this link):

<http://www.udot.utah.gov/index.php?m=c&tid=198>

An electronic file of the DBE Directory is available for downloading to use in the Electronic Bidding system (EBS) at the following URL (click on this link):

<http://www.udot.utah.gov/index.php/m=c/tid=317>

2. The DEPARTMENT will grant DBE credit toward *race neutral* goals for work performed by firms who are not DBE certified prior to bid opening or who bid types of work for which DBE certification has not been granted by the DEPARTMENT prior to bid opening but subsequently are granted DBE certification.

3. Commitments to DBEs that exceed the Goal for Bid Evaluation will be considered as both race conscious and race neutral. The dollar amount of the Goal for Bid Evaluation will be considered to be race conscious participation. Any dollar amounts in excess of the Goal for Bid Evaluation will be considered as race neutral participation.

F. COUNTING DBE PARTICIPATION TOWARD GOALS FOR PERFORMANCE

Subcontracts to DBEs that exceed the *Goal For Bid Evaluation* will be considered in part as race conscious participation and in part as race neutral participation. Any dollar amounts in excess of the *Goal For Bid Evaluation* will be considered as race neutral participation.

It is intended that the Contractor shall utilize the subcontractors designated in the DBE Commitment in the performance of the contract. Any changes in the Contractor's DBE Commitment, such as substitution of a DBE subcontractor, substitution of contract items, or decrease in total dollar amount must be approved by the DEPARTMENT and must be covered by a Change Order. Unauthorized substitutions or eliminations may result in the imposition of sanctions. Failure to meet the Goal for Performance, that is established at the time of award by the Contractor's DBE Commitment, without adequate justification, including concurrence of the ENGINEER and Civil Rights Manager, shall result in the imposition of sanctions as provided in Part I of this Special Provision.

1. Only the value of the work actually performed by the DBE will count toward DBE goals.
2. Contractors may count toward their contract goals a portion of the total dollar value of a contract with a joint venture eligible under the standards of this bid condition equal to the percentage of the ownership and controls of the DBE partner in the joint venture.
3. The ENGINEER will recognize and grant DBE credit for work subcontracted and performed by DBE subcontractors ONLY in the types of work for which DBE certification has been granted by the UUCP prior to bid opening. It is necessary that all Bidders refer to the UUCP DBE Directory for direction and guidance. A current copy of the UUCP DBE directory is available through the Civil Rights Office and on the Internet at (click on this link):

<http://www.udot.utah.gov/index.php?m=c&tid=198>

An electronic file of the DBE Directory is available for downloading to use in the Electronic Bidding system (EBS) at the following URL (click on this link):

<http://www.udot.utah.gov/index.php/m=c/tid=317>

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4. Contractors may count toward their goals only the value of the work actually performed by the DBE toward the DBE goals.
  - a. Work performed by the DBE's own forces using "regular employees" and "regular equipment."
  - b. The cost of supplies and materials obtained and purchased by the DBE and equipment leased for the work of the contract.
  - c. Work that a DBE subcontracts to a lower tier DBE firm.
5. Contractors may not count toward the DBE goals:
  - a. Supplies and material purchased and equipment leased by the DBE from the prime Contractor or its affiliates or another subcontractor on the project.
  - b. Work that a DBE subcontracts to a lower tier non-DBE firm.
6. Contractors may count toward their goals only expenditures to a DBE that performs a commercially useful function in the work of the contract.
  - a. A DBE performs a "commercially useful function" when it is responsible for the execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself.
  - b. The DEPARTMENT shall evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors.
  - c. A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation. In determining whether a DBE is such an extra participant, the DEPARTMENT must examine similar transactions, particularly those in which DBEs do not participate.

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- d. A DBE does not perform a commercially useful function if it does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved.
7. The DEPARTMENT shall use the following factors in determining whether a DBE trucking company is performing a commercially useful function:
- a. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
  - b. The DBE must be responsible for the management and supervision of the entire trucking arrangement for the purpose of meeting DBE goals.
  - c. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
  - d. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
  - e. The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit for the total value of the transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement.

**Example:** Leases two trucks from DBE Firm Y and six trucks from non-DBE Firm Z. DBE credit would be awarded for the total value of transportation services provided by Firm X and Firm Y, and may also be awarded for the total value of transportation services provided by four of the six trucks provided by Firm Z. In all, full credit would be allowed for the participation of eight trucks. With respect to the other two trucks provided by Firm Z, DBE credit could be awarded only for the fees or commissions pertaining to those trucks Firm X receives as a result of the lease with Firm Z.

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- f. For purposes of this paragraph (d), a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.
8. Contractors may count expenditures with DBEs for materials or supplies as provided in the following:

- a. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies counts toward DBE goals.

For purposes of this paragraph, a manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

- b. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies counts toward DBE goals.

For purposes of this paragraph, a regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

- (1) To be a regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.
- (2) A firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating or maintaining a place of business if the firm both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an *ad hoc* or contract-by-contract basis.
- (3) Packagers, brokers, manufacturers representatives, or other persons or firms who arrange, or expedite, transactions are not regular dealers.

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- (4) A DBE trucking company that picks up a product from a manufacturer or regular dealer and delivers the product to the Contractor performs a delivery service. Credit will not be given based on a percentage of the cost of the product; credit will be allowed only for the cost of the transportation service.
9. If the materials or supplies are purchased from a service provider, the fees or commission charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies, count toward the DBE goals.

A Service Provider is a business that is neither a manufacturer nor a regular dealer but simply transfers title of a product from manufacturer to ultimate purchaser or a firm that puts a product into a container for delivery. A service provider charges a fee or a commission for assistance in the procurement of the materials and supplies, or fees or transportation for the delivery of materials or supplies required on a job site.

  - a. Only the fees, commissions, or transportation performed by the DBE service provider count toward the DBE goals. The DEPARTMENT must determine that the fees are reasonable and not excessive as compared with fees customarily allowed for similar services.
  - b. No portion of the cost of the materials and supplies count toward the DBE goals. Documentary evidence of the supply agreements, i.e., sales contract, purchase order, etc., shall be submitted to the Resident Engineer or Consultant Engineer at the Preconstruction Conference. The agreement shall set forth the estimated quantities, unit prices, total dollar amounts, material guarantees, delivery, and payment requirements including the requirements listed part E, 4, e, of this DBE Special Provision.
10. Prompt payment for the work accomplished is an integral part of the concept of commercially useful function.

See Section F, Subsection 6,a for a definition of “commercially useful function.”
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### G. CONTRACTOR’S RESPONSIBILITY

1. It is the Contractor’s responsibility to determine the level of professional competence and financial responsibility of any proposed DBE subcontractor. The Contractor shall ascertain that the proposed DBE subcontractor is particularly experienced and equipped for the work of the subcontract.
2. It is the Contractor’s responsibilities to monitor and assure that DBE’s listed to fulfill DBE goals perform a commercially useful function.

H. DBE SUBCONTRACTOR'S FAILURE TO PERFORM SUCCESSFULLY

If, during the performance of the contract, the Prime Contractor determines that a DBE subcontractor is unable to perform successfully, the Contractor shall make good faith efforts to replace the DBE subcontractor with another DBE to fulfill the Goal for Bid Evaluation. For Race Conscious DBE participation, the Contractor shall consider the uncompleted DBE committed work items as well as other work items as a part of the good faith efforts. All substitutions of DBE subcontractors shall receive prior approval by the DEPARTMENT.

The Contractor shall not substitute DBE subcontractor(s), work item(s), nor decrease dollar amount(s) as indicated in the Contractor's DBE Commitment without prior submission of written justification to the ENGINEER and without prior approval of the ENGINEER and the Civil Rights Manager.

The Contractor shall not substitute DBE subcontractor(s), work item(s), nor decrease dollar amount(s) as indicated in the Contractor's DBE Commitment Substitutions without prior submission of a written statement from the DBE consenting to the substitution or decrease and holding the ENGINEER harmless for approving the substitution.

Unauthorized substitutions of the DBE(s), underruns of work item(s), or decreases in dollar amount(s) may result in the imposition of sanctions as allowed under Section I.

UDOT reserves the right to authorize completion of the work that was subcontracted to a DBE who is unable to perform successfully by either of the following methods:

1. Approve, at no additional cost to the DEPARTMENT, a replacement DBE subcontractor and, when appropriate, modify the contract to provide for reasonable extra time necessary to obtain a DBE replacement at no additional cost to the DEPARTMENT.
2. Direct the Contractor to perform at unit bid prices. In the event this option is selected, the percentage DBE goal will be adjusted as may be appropriate.

I. SANCTIONS

1. The Contractor's DBE Commitment becomes a 3-part commitment comprised of the DBE Contractor(s), work item(s) and dollar amount(s). The Commitment becomes a contract specification upon award of the contract and becomes the minimum goal for contract performance.

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If the Contractor fails to achieve the minimum goal, established in the contract at the time of the award of the contract or later modified, the contract payments shall be reduced as a liquidated damage and not as a penalty by an amount equal to the dollar amount of work not performed by the DBE. The dollar amount of any sanction will be computed using the unit prices indicated in the DBE subcontract

Exceptions:

- a. Any authorized adjustment in the DBE Commitment that has been approved by the ENGINEER and Civil Rights Manager.
  - b. Race neutral participation.
2. The ENGINEER shall deduct maximum points for *Compliance with EEO* when completing the *Contract Performance Report*.

### J. RECORD KEEPING

1. The DEPARTMENT must create and maintain a Bidders list consisting of all firms bidding on prime contracts and bidding or quoting subcontractors on DOT-assisted projects. For every firm, the following information must be submitted annually:
  - a. Firm name
  - b. Firm address
  - c. Firm's status as a DBE or non-DBE
  - d. Age of firm
  - e. Annual gross receipts of the firm.

Every firm bidding or quoting as a prime or subcontractor at any level on DOT-assisted projects must register annually with UDOT.

NOTE: Items (a) and (b) should be completed in the EBS software by using the 'Quote Comparison' and submitted with your bid.

2. With the bid or no later than 10 work days after bid opening date, each and every prime bidder must submit to The DEPARTMENT a list of all firms bidding and/or quoting as subcontractors, service providers or suppliers.\* The Prime Bidder must also submit for each and every firm sub-quoting the following information:
  - a. Firm Name



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- b. Firm address
- c. Work classification(s) bid by subcontractor, service provider or supplier:
  - (1) Building
  - (2) Concrete: Curb & gutter, Flatwork, Inlet Boxes, etc.
  - (3) Concrete: Structural
  - (4) Consulting firms
  - (5) Demolition
  - (6) Electrical: Hwy lighting, signals & fiber optics
  - (7) Equipment rentals and sales
  - (8) Excavation
  - (9) Fencing
  - (10) Grading
  - (11) Guardrail
  - (12) Landscaping & erosion control
  - (13) Miscellaneous
  - (14) Painting: Highway structures
  - (15) Painting: Highway striping & painted messages
  - (16) Paving: Asphalt highway & runway, etc.
  - (17) Paving: Concrete
  - (18) Paving: Miscellaneous
  - (19) Pipe Culverts, drainage, sewer & water
  - (20) Reconstruction : Manholes, etc.
  - (21) Rotomilling
  - (22) Sawing & sealing
  - (23) Signs permanent
  - (24) Steel reinforcing
  - (25) Steel structural
  - (26) Surveying
  - (27) Traffic Control: Flagging
  - (28) Traffic Control: Temp. Signs and Devices
  - (29) Trucking
  - (30) Supplier: Manufacturer
  - (31) Supplier: Regular Dealer
  - (32) Supplier: Service Provider

\*NOTE: This requirement can be met with the 'Quote Comparison' function in EBS. The report must be printed and faxed to the Civil Rights Department at (801) 965-4101.

## **Exhibit A**

### **Suggested Actions and Required Documentation to Demonstrate Good Faith Efforts to Comply With DBE Requirements**

A Bidder must show that it took necessary and reasonable steps to achieve a DBE goal that, by their scope, intensity, and appropriateness, can reasonably be expected to fulfill the program requirement. The efforts employed should be those that would be taken if a Bidder were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE contract. Goal. Mere *pro forma* efforts are not good faith efforts to meet the DBE contract requirements.

Documentary evidence of each action taken must be submitted with the Bid Proposal.
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The following is taken, with some modification, from CFR 49 Part 26, Appendix A. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive.

## **GUIDANCE CONCERNING GOOD FAITH EFFORTS**

- I. When the DEPARTMENT establishes a contract goal on a Federal aid contract, a Bidder must, in order to be responsive, make good faith efforts to meet the goal. The Bidder can meet this requirement in either of two ways:
  - A. The Bidder can meet the goal, documenting commitments for participation by DBE firms sufficient for this purpose.
  - B. If it doesn't meet the goal, the Bidder can document adequate good faith efforts. This means that the Bidder must show that it took all necessary and reasonable steps to achieve a DBE goal or other requirement of this part that, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not fully successful.
- II. In any situation in which the DEPARTMENT has established a contract goal, CFR 49, Part 26 requires UDOT to use the good faith efforts mechanism of this part. It is up to the DEPARTMENT to make a fair and reasonable judgment whether a Bidder that did not meet the goal made adequate good faith efforts. It is important for the DEPARTMENT to consider the quality, quantity, and intensity of the different kinds of efforts that the Bidder has made. The efforts employed by the Bidder should be those that one could reasonably expect a Bidder to take if the Bidder were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE contract goal. Mere pro forma efforts are not good faith efforts to meet the DBE contract requirements. The DEPARTMENT emphasizes, however, that its determination concerning the sufficiency of the firm's good faith efforts is a judgment call: meeting quantitative formulas is not required.
- III. The U. S. Department of Transportation also strongly cautions the DEPARTMENT against requiring that a Bidder meet a contract goal (i.e., obtain a specified amount of DBE participation) in order to be awarded a contract, even though the Bidder makes an adequate good faith efforts showing. This rule specifically prohibits UDOT from ignoring bona fide good faith efforts.
- IV. The following is a list of types of actions that UDOT should consider as part of the Bidder's good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases.
  - A. Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBEs who have the capability to perform the work of the contract. The Bidder must solicit this interest within sufficient time to allow the DBEs to respond to the solicitation. The Bidder must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

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- B. Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime Contractor might otherwise prefer to perform these work items with its own forces.
- C. Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.
- D. Negotiating in good faith with interested DBEs.
  - (1) It is the Bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.
  - (2) A Bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration.
    - (a) The fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable.
    - (b) No specific price differential has been established by 49 CFR 26. This approach allows flexibility.
    - (c) Along with the reasonableness of the cost necessarily comes the fact that prime Contractors are not expected to bear unreasonable costs.
    - (d) Any burden that a non-DBE subcontractor might face is also limited by the reasonableness of competing bids.

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- (3) The ability or desire of a prime Contractor to perform the work of a contract with its own organization does not relieve the Bidder of the responsibility to make good faith efforts. Prime Contractors are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.
  - (4) The ability or desire of a prime Contractor to bundle the work of a subcontractor who wishes to perform all the work of the subcontract with its own organization does not relieve the Bidder of the responsibility to require a subcontractor to make good faith efforts. Subcontractors are not required to accept higher quotes from lower tier DBEs if the price difference is excessive or unreasonable.
- E. Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The Contractor's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the Contractor's efforts to meet the project goal.
- F. Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
- G. Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.
- H. Effectively using the services of available minority/women community organizations; minority/women Contractors' groups; local, state, and Federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs.

NOTE: The DBE 'Contact Log' in EBS, submitted as part of the Bid Proposal, can be used to document the following efforts:

- IV. A.
- IV. C.
- IV. D. (1)

The 'Quote Comparison' in EBS, submitted as part of the Bid Proposal, can be used to document the following efforts:

- IV. B.
- IV. D. (3)

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- V. In determining whether a Bidder has made good faith efforts, the DEPARTMENT may take into account the performance of other Bidders in meeting the contract. For example, when the apparent successful Bidder fails to meet the contract goal, but others meet it, UDOT may reasonably raise the question of whether, with additional reasonable efforts, the apparent successful bidder could have met the goal. If the apparent successful Bidder fails to meet the goal, but meets or exceeds the average DBE participation obtained by other Bidders, you may view this, in conjunction with other factors, as evidence of the apparent successful Bidder having made good faith efforts.

Submit with the Bid Proposal documentary evidence to prove that good faith efforts were accomplished:

1. Submit copies of all solicitations: correspondence, faxes, advertisements, telephone logs with dates, times, names of persons contacted, nature of conversation, DBEs' responses, and etc.
2. If DBEs submitted quotes that were not used because the range of additional costs was determined to be excessive or unreasonable, submit the range that has been determined by the Bidder to be a reasonable range of additional costs and explain how that range was determined.
3. As a part of demonstrating a reasonable range of additional costs, submit copies of all subcontractor quotes, copies of spread sheet(s) which compare all DBE quotes with non-DBE quotes and which include bid item(s) quoted, work classifications, quantities, prices, and dollar amounts.
4. Submit a narrative of specific names and types of information, assistance, considerations given, and efforts to assist DBEs under Item IV, subparts C through F.

**DBE BID ASSURANCE  
COMPLETE ONLY PART A. OR PART B.**

**PART A. RACE CONSCIOUS DBE PARTICIPATION  
SPECIFIC ASSIGNED *CONTRACT DBE GOAL* FOR BID  
EVALUATION \_\_\_\_\_ PERCENT**

If the DBE goal which is indicated in Section A, *CONTRACT GOAL*, of APPENDIX A, *BID CONDITIONS*, *DISADVANTAGED BUSINESS ENTERPRISE (DBE)* is greater than 0.0 percent, complete only Part A, and submit *DBE Commitment*, and if applicable, *Documentation of Good Faith Efforts*.

By signing the BID REPORT (either manually or electronically), it is understood that those individuals who sign as owners or authorized representatives of the Bidder, have read and are familiar with APPENDIX A, *SPECIAL PROVISION*, *BID CONDITIONS*, *DISADVANTAGED BUSINESS ENTERPRISE* and hereby certify that good faith efforts have been utilized to meet or exceed the goal of the DBE Program as established by the DBE Special Provision.

Indicate intended DBE commitment.

\_\_\_\_\_ We intend to meet or exceed the contract goals as per the DBE Commitment which is submitted with the Bid Proposal.

RACE CONSCIOUS AND RACE NEUTRAL COMMITMENT \_\_\_\_\_ PERCENT

\_\_\_\_\_ We fail to meet the advertised goal. This firm commits to DBE participation as per the DBE Commitment that is submitted with the EBS Bid Proposal and to continue Good Faith Efforts throughout the performance of the project. Documentation of Good Faith Efforts is submitted with the Bid Proposal, including:

1. DBE Contact Log Report
2. Quote Comparison Report

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**PART B. RACE NEUTRAL DBE PARTICIPATION  
ASSIGNED *CONTRACT DBE GOAL* FOR BID EVALUATION  
\_\_\_\_\_ PERCENT**

If the DBE goal, which is indicated in Section A, *CONTRACT GOAL*, of APPENDIX A, *BID CONDITIONS*, *DISADVANTAGED BUSINESS ENTERPRISE (DBE)* is 0.0 percent, complete only Part B and submit *Race Neutral DBE Information*.

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By signing the BID REPORT (either manually or electronically), it is understood that those individuals who sign as owners or authorized representatives of the Bidder, have read and are familiar with APPENDIX A, SPECIAL PROVISION, BID CONDITIONS, DISADVANTAGED BUSINESS ENTERPRISE and hereby certify that equal opportunity action has been utilized to allow DBEs to compete for and perform on subcontracts.

\_\_\_\_\_ We do not intend to sublet a portion of the contract work.

\_\_\_\_\_ We intend to sublet a portion of the contract work. Our firm has taken equal opportunity action to allow DBEs to compete for and perform on subcontracts. Documentation of Race Neutral efforts is submitted with the Bid Proposal, including:

- \_\_\_\_\_ 1. RACE NEUTRAL DBE COMMITMENT \_\_\_\_\_ PERCENT
- \_\_\_\_\_ 2. DBE Contact Log Report
- \_\_\_\_\_ 3. Quote Comparison Report



**IX. Attention Contractors**

**E.E.O. Affirmative Action Requirements on  
Federal and Federal-Aid Construction Contracts of \$10,000 or More**

Include the Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity, Executive Order (EO) 11246, as amended (incorporated by reference & Appendix A - below) and the Standard Federal Equal Employment Opportunity Construction Contract Specifications set forth in §60-4.3 (incorporated by reference) in all requests for bids/solicitations on all contracts and subcontracts of \$10,000 or more

Include in Appendix A, Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity, the goals established by the Office of Federal Contract Compliance Programs (OFCCP) for minority and female participation in each craft on all contracts and subcontracts.

**APPENDIX A (EO 11246)**

The OFCCP goals for minority representation in each trade are shown below. The goal for female utilization (6.9 percent) applies to all contracts and subcontracts irrespective of their geographical location.

COUNTY	GOAL	COUNTY	GOAL	COUNTY	GOAL
Beaver	12.6	Box Elder	5.1	Cache	5.1
Carbon	5.1	Daggett	5.1	Davis	6.0
Duchesne	5.1	Emery	5.1	Garfield	12.6
Grand	10.2	Iron	12.6	Juab	5.1
Kane	12.6	Millard	5.1	Morgan	5.1
Piute	5.1	Rich	5.1	Salt Lake	6.0
San Juan	10.2	Sanpete	5.1	Sevier	5.1
Summit	5.1	Tooele	6.0	Uintah	5.1
Utah	2.4	Wasatch	5.1	Washington	12.6
Wayne	5.1	Weber	6.0		

These goals are applicable to all contractors' or subcontractors' construction work (whether or not it is Federal or Federally assisted) performed in the covered area.

The Bidder's attention is called to the "Equal Opportunity Clause" (form FHWA 1273- II 1 b, included in this contract) and the "Standard Federal Equal Employment Specifications" set forth in 41 CFR Part 60-4 (incorporated by reference).

Compliance with the Executive Order and the regulations in 41 CFR part 60-4 is based on the implementation of the "Equal Opportunity Clause," specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and the efforts to meet the goals.

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Provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification lists the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract will be performed.

Under Section 303 of EO 11246, only the U. S. Department of Labor (DOL) has the authority to determine compliance with EO 11246 and its implementing regulations. The Federal Highway Administration (FHWA) and the State highway agency (UDOT) do not have independent authority to determine compliance with EO 11246, 41 CFR Chapter 60, or the minority and female participation goals established by the Office of Federal Contract Compliance Programs (OFCCP), pursuant to 41 CFR Chapter 60.

If the State highway agency (UDOT) or the FHWA becomes aware of any possible violations of EO 11246 or 41 CFR Chapter 60, each has the authority and the responsibility to notify the OFCCP.

### **APPENDIX B**

As used in these specifications:

- a. Covered area: The geographical area described in the solicitation from which this contract resulted;
- b. Director: Director, Office of Federal Contract Compliance Programs, United State Department of Labor, or any person to whom the Director delegates authority;
- c. Employer identification number: The Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- d. Minority includes:
  - (i) Black (all persons having origins in any of the black African racial groups not of Hispanic origin);
  - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
  - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
  - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

## **X. Specific Equal Employment Opportunity Responsibilities**

### **1. General**

- a. The State Transportation Agency (STA) and Federal Highway Administration (FHWA) have the authority and the responsibility to ensure compliance with 23 USC Section 140 and Title VI of the Civil Rights Act of 1964, as amended, and related regulations, including 49 CFR Parts 21 and 23, and 23 CFR Parts 200, 230, and 633. Pursuant to this authority, the STA and the FHWA will conduct compliance reviews of contractors on federally funded highway projects to determine compliance with these laws and related regulations. The STA will prepare complete, written reports of findings of the compliance reviews. The FHWA will analyze the reports, and the evidence on which they are based.
- b. A contractor's EO requirements are in the contract provisions referenced in the FHWA-1273 (included herein). These include contractor acceptance of Section II, 1 c, and the obligation of the contractor to comply with specific EO activities at a minimum.
- c. Submit form PR-1391 in July and at other times when such information is required by the STA or the FHWA; and submit other documentation and reports as requested by the STA or the FHWA.

### **2. Equal Employment Opportunity (EEO)**

- a. Where minorities and women have been excluded from certain classifications in a contractor's work force, the EEO affirmative action requirements specified in the contract will be implemented in good faith to provide EEO.
- b. The contractor will use the avenue afforded by the Training Special Provision (included herein) to increase minority and female employment in crafts where they have been underrepresented.

### **3. Minority and Female Average Availability Percentages – Utah**

- a. Average percentages for minority (M) and female (F) availability in each trade, by County, are shown below. Availability is defined as "an estimate of the number of qualified minorities or women available for employment in a given job group."

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COUNTY	M	F	COUNTY	M	F	COUNTY	M	F	COUNTY	M	F
Beaver	6.8	3.0	Box Elder	9.9	5.0	Cache	9.9	5.0	Carbon	12.3	3.0
Daggett	12.3	3.0	Davis	8.9	3.0	Duchesne	12.3	3.0	Emery	15.5	5.0
Garfield	15.5	5.0	Grand	15.5	5.0	Iron	6.8	3.0	Juab	8.2	4.0
Kane	15.5	5.0	Millard	6.8	3.0	Morgan	11.1	3.0	Piute	15.5	5.0
Rich	9.9	5.0	Salt Lake	21.6	5.0	San Juan	15.5	5.0	Sanpete	8.2	4.0
Sevier	15.5	5.0	Summit	11.1	3.0	Tooele	8.2	4.0	Uintah	12.3	3.0
Utah	11.9	4.0	Wasatch	11.1	3.0	Washington	10.0	4.0	Wayne	15.5	5.0
Weber	17.8	5.0									

- b. The use of these average percentages in no way precludes the contractor from performing and documenting good faith efforts to recruit and employ minorities and females.

### 4. Compliance Determinations

- a. The list below is a set of “Good-Faith Efforts” criterion established in FHWA’s regulatory and policy requirements that may be used to determine a contractor’s good faith efforts:
1. Contractor’s EEO Policy
  2. Dissemination of the EEO Policy
  3. Authority and Responsibility of EEO Officer
  4. Periodic EEO meetings (EEO indoctrination)
  5. Notices/posters on bulletin board
  6. Advertising as an “EEO Employer”
  7. Recruitment – Systematic and direct recruitment efforts with sources likely to yield minorities and women
  8. Educate all new supervisors within 30 days of reporting to duty
  9. Encourage present employees to refer minorities and women
  10. Evaluates the spread of wages to determine whether discrimination exists
  11. Investigates all complaints, promptly, and appropriate corrective action is taken
  12. Assist in locating, qualifying, and increasing the skills of minorities and women
  13. Fully uses training programs and advises employees and applicants of opportunities
  14. Minorities and women exist in contractor’s training program
  15. Ensure nonsegregated facilities
  16. Minorities and women are employed in all occupations, crafts, and job classifications on an equal basis
  17. Procedures establishing the monitoring of subcontractors’ compliance with nondiscrimination, EO and EEO obligations
  18. The need for adequate records and reports

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19. Minorities and women reach accumulating work hours expected based on their representation
- b. Affirmative Action is determined based on the evaluation of the contractor's compliance with all of the above good faith efforts and on the contractor's efforts to achieve maximum results from the actions.
- c. A contractor is in compliance when there is no evidence of discrimination in employment, training, DBE, Indian Preference provisions, equal opportunity requirements, or evidence every good faith effort has been made.

### 5. Training Special Provisions

This Training Special Provisions supersedes subparagraph II 6b of the FHWA-1273, and is an implementation of 23 U.S.C.140 (a).

Provide training as follows as part of the equal employment opportunity affirmative action program:

Provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained under the special provision is 2 (amount to be filled in by the State Highway Department (STA)).

If a portion of the contract work is subcontracted, determine how many, if any, of the trainees are to be trained by the Subcontractor. Make this training special provision applicable to the subcontract. Retain the primary responsibility for meeting the training requirements imposed by this special provision. Where feasible, 25 percent of apprentices or trainees in each occupation will be in their first year of apprenticeship or training.

Distribute the number of trainees among the work classifications on the basis of needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, submit to the State highway agency for approval the number of trainees to be trained in each selected classification and training program to be used. Specify the starting time for training in each of the classifications. The STA gives credit for each trainee employed on the contract work who is currently enrolled or becomes enrolled in an approved program. Reimbursement is made for the trainees as provided below.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. Demonstrate the steps taken to achieve compliance with

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this Training Special Provision. This training commitment is not intended nor used to discriminate against any applicant for training, whether a member of a minority group or not.

Do not employ a trainee in any classification in which they have successfully completed a training course leading to journeyman status or in which they have been employed as a journeyman. Include appropriate questions in the employee application or by other suitable means to satisfy this requirement. Document the findings in each case.

The training program selected, and approved by the STA and the FHWA, establishes the minimum length and type of training for each classification in that program. The STA and the FHWA approves a program if it meets the equal employment opportunity obligations and qualification of the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and training are considered acceptable if administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program is obtained from the State prior to commencing work on the classification covered by the program. Provide training in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification if approved by the division office. Some off-site training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, reimbursement is made of 80 cents per hour for training given an employee, on this contract, in accordance with an approved training program. This reimbursement is made even though additional training program funds are received from other sources provided such other source does not specifically prohibit other reimbursements. Reimbursement for off-site training indicated above may only be made where the trainees are concurrently employed on a Federal-aid project and one or more of the following is done: contributes to the cost of the training, provides the instruction to the trainee, or pays the trainee's wages during the off-site training period.

No payment of the 80 cents per hour is made if either the failure to provide the required training or the failure to hire the trainee as a journeyman occurs and evidences a lack of good faith effort in meeting the requirements of this Training Special Provision. A trainee begins training on the project as soon as feasible after start of work. The trainee remains on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. Responsibilities under this Training Special

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Provision are fulfilled if acceptable training to the number of trainees specified is provided.

Trainees are paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

Furnish the trainee a copy of the program to be followed in providing the training. Provide each trainee with a certification showing the type and length of training satisfactorily completed.

Provide for the maintenance of records and furnish periodic reports documenting their performance under this Training Special Provision. UDOT form C-138, Monthly Training Report satisfies this reporting requirement.

## XI. Required Contract Provisions

### FEDERAL-AID CONSTRUCTION CONTRACTS

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XII.	Certification Regarding Use of Contract Funds for Lobbying

#### ATTACHMENTS

A. Employment Preference for Appalachian Contracts (included in Appalachian contracts only)

#### I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

- Section I, paragraph 2;
- Section IV, paragraphs 1, 2, 3, 4, and 7;
- Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

#### II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 *et seq.*) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.



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3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

### 6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

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b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

**8. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

**9. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

### III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

### IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

#### 1. General:

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual

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relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

### 2. Classification:

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

### 3. Payment of Fringe Benefits:

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

### 4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

#### a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality

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other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

### b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

### c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

### 5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

### 6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

### 7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

### 8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the

# Federal Projects With Full Size Plan Sheets

standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

## 9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

## V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

### 1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

### 2. Payrolls and Payroll Records:

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

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## VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

## VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

## VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

## IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

## NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

*"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans,*

## Federal Projects With Full Size Plan Sheets

*maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or*

*Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or*

*Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented; Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."*

### **X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 *et seq.*, as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 *et seq.*, as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

### **XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

#### **1. Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

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j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\* \* \* \* \*

### **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions**

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*

### **2. Instructions for Certification - Lower Tier Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

\* \* \* \* \*

### **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*



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### **XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**XII. Wage Rates Applicable/Wage Rates Non-Applicable**

Delete this line and insert wage rates on next page.

GENERAL DECISION: **UT20030023** 08/12/2005 UT23

Date: August 12, 2005

General Decision Number: **UT20030023** 08/12/2005

Superseded General Decision Number: UT020023

State: **Utah**

Construction Type: **Highway**

Counties: **Davis and Weber Counties in Utah.**

**HIGHWAY CONSTRUCTION PROJECTS**

Modification Number	Publication Date
0	06/13/2003
1	01/23/2004
2	03/05/2004
3	09/17/2004
4	04/15/2005
5	08/12/2005

**ELEC0354-002 12/01/2002**

	Rates	Fringes
Electrician.....	\$ 23.96	6.34+4.2%

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**\* ENGI0003-016 07/01/2005**

	Rates	Fringes
Power equipment operators:		
Blade smooth/finish.....	\$ 21.68	10.03
Tractor, small rubber tire		
with attachments.....	\$ 19.68	10.03

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**IRON0027-004 07/01/2003**

	Rates	Fringes
Ironworker, Reinforcing.....	\$ 21.76	9.67

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**SUUT1992-007 03/25/1992**

	Rates	Fringes
Carpenter.....	\$ 16.13	2.80
Cement Mason.....	\$ 14.40	2.41
Flagger.....	\$ 6.59	1.75
Ironworkers:		
Ornamental & Structural.....	\$ 16.65	3.65
Laborers:		
Concrete Laborer		
(Compaction, Underground		
Fine Grading, Operation of		
Shute or Bucket).....	\$ 10.04	2.53
Fence Erection Laborer		
(clearing of right of way,		
unloading of materials by		

and pouring of concrete in connection therewithin).....\$ 12.47	2.84
General Laborer.....\$ 11.30	2.73
Pipelayers (Smooth sides and bottom of trenches, does rigging of pipe, assembles and installs concrete and tile pipe).....\$ 12.52	2.79
Power Tool Cutting Torch, Operators of gasoline, electric, or pneumatic tools, (E.G. Compressor, compactor, jackhammer, vibrator, concrete saw, chain saw and concrete cutting torch.....\$ 12.52	2.79
Painter, Spray.....\$ 14.05	1.62
Piledriverman.....\$ 23.54	2.80
Power equipment operators:	
Backhoe, Tire & Track, over 5 cu. yds.....\$ 18.14	7.03
Backhoe, Tire & Track, under 5 cu. yds.....\$ 17.82	7.15
Backhoe/Loader Combo.....\$ 18.55	6.67
Blade, Smooth/Finish.....\$ 18.28	6.84
Bulldozer, D7 or less.....\$ 17.59	7.08
Heavy Duty Repairman.....\$ 18.05	7.11
Loader, over 10 cu. yds.....\$ 18.95	6.94
Loader, under 2 1/2 cu. yds.....\$ 17.15	7.08
Piledriver.....\$ 21.85	7.23
Roller, Asphalt.....\$ 17.15	7.23
Roller, Grade/Compaction....\$ 15.48	5.82
Sheepfoot Compactor.....\$ 16.29	7.08
Truck drivers: (Dump Trucks - Water Level capacity (Bottom, end and side), including Dumpster Truck, Turnawagons, Turnarockers and dumpcrete):)	
8 cu. yds. and less than 14 cu. yds.....\$ 15.99	4.91
Less than 8 cu. yds.....\$ 15.84	5.87
Mixer Truck.....\$ 8.63	

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\* TEAM0222-001 07/01/2003

	Rates	Fringes
Truck Driver, Dump		
Dump Trucks - Water		
Level Capacity (Bottom,		
End and Side),		
Including Dumpster		
Truck, Turnawagons,		
Turnarockers and		
Dumpcrete: 14 cu yds.		
and less than 35 cu.		
yds.....	\$ 16.49	7.52

\* TEAM0222-008 07/01/2003

	Rates	Fringes
Truck drivers: (Water, Fuel		
& Oil Tank)		
0 to less than 1,200		
gal.....	\$ 16.065	7.52
1,200 gal. to less than		
2,500 gal.....	\$ 16.19	7.52
10,000 gal. to less		
than 15,000.....	\$ 17.14	7.52
15,000 gal. to less		
than 20,000 gal.....	\$ 17.39	7.52
2,500 gal. to less than		
4,000.....	\$ 16.34	7.52
20,000 gal. to less		
than 25,000 gal.....	\$ 17.74	7.52
4,000 gal. to less than		
6,000 gal.....	\$ 16.64	7.52
6,000 gal. to less than		
10,000 gal.....	\$ 16.89	7.52
Over 25,000 gal.....	\$ 17.89	7.52

**WELDERS** - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

## WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.  
=====

END OF GENERAL DECISION

### **XIII. Special Provisions and Supplemental Specifications**



September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 00250S**

**PREBID CONFERENCE**

**Add Section 00250:**

**PART 1      GENERAL**

**1.1      SCHEDULING**

- A.      A mandatory Pre-Bid Conference will be held at the following time and location:

Date: November 2 Time: 10:00 A.M.

Location: Region 1 Headquarters  
166 West Southwell Street  
Ogden, Utah 84404-4194

Project ID: STP-3328(1)0

- B.      Representatives of Construction and Design will be present to discuss details related to this project.
- C.      Bids submitted by Contractors who did not attend the pre-bid conference will be non-responsive.

**PART 2      PRODUCTS      Not Used**

**PART 3      EXECUTION      Not Used**

**END OF SECTION**

September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 00555M**

**PROSECUTION AND PROGRESS**

**PART 1 GENERAL**

**1.1 RELATED SECTIONS**

- A. Section 00570: Definitions
- B. Section 01282: Payment
- C. Section 01355: Environmental Protection

**1.2 PRECONSTRUCTION CONFERENCE**

- A. Contact Engineer to schedule Pre-Construction Conference following Notice of Award.

**1.3 NOTICE TO PROCEED**

- A. Proceed with the work after receipt of written notice from the Department.
- B. Notify the Engineer at least five calendar days before beginning work.

**1.4 SUBLETTING CONTRACT**

- A. Obtain written approval of the Department before subletting, selling, transferring, assigning or disposing any portion of the Contract or Contracts.
- B. Sublet no more than 70 percent of the total contract work bid amount.
- C. Subcontracts whether committed to in writing or by an informal, unwritten arrangement or transfer of the Contract, or any part of it or its obligations, do not

relieve liability under the Contract and bonds. As part of its contract with the Department, the Contractor accepts liability for any claims for damages or liability resulting from an act or omission of any person who carried out work on its behalf, whether that working relationship is codified into a subcontract or carried out by an informal, unwritten agreement. The Contractor agrees to indemnify the Department for any damages or liability, including attorneys fees and court costs, that may be incurred by such a person.

- D. Do not allow subcontract work to begin until approved by Engineer.
- E. In computing the percentage of subcontracted work, Department considers an item as subcontracted in its entirety unless otherwise designated in the subcontract.
  - 1. Department uses the accumulated percentages of all approved subcontracts to assure that the maximum subcontracted limitation is not exceeded.
  - 2. To determine the amount of work subcontracted, the Department uses the total dollar amount of the items subcontracted in the Contract Bid Proposal, divided by the original contract amount.
  - 3. If the prime Contractor is to perform a portion of an item, the Department determines the amount of work subcontracted by using the dollar amount of the item agreed to between the prime Contractor and the subcontractor, excluding bonds, insurance, profit, and office transaction, etc. performed by the Contractor.
- F. Provide for a reduction in retained monies commensurate with the percentage held as retainage as provided for in Section 01282.
- G. Include a statement agreeing on a method of distribution of any adjustments due to price increases or decreases using applicable price adjustment specifications for fuel, cement, common carrier rates, etc.

## **1.5 ANTICIPATED MONTHLY PAYMENT SCHEDULE**

- A. Prepare the Anticipated Monthly Payment Schedule based on the proposed sequence of activities shown in the baseline construction schedule.
  - 1. Use form provided by the Engineer
  - 2. Submit the proposed Monthly Payment Schedule before the date established for the first partial payment.
  - 3. Include both monthly and semi-monthly payments when anticipated due to the volume of work on the project.
  - 4. Include all months during the life of the contract when payments are anticipated.
  - 5. Include dates of contract start, suspension, completion and milestones that impact payments.

- B. Submit Revised Payment Schedule within 30 days of notification by the Engineer. Payment Schedule Revisions are required when:
  - 1. Actual Payments vary 10 percent or more (plus or minus) from the submitted Payment Schedule and the variance is sustained for 60 days.
  - 2. Contract start, suspension, completion and milestones dates change.
  - 3. Change Orders are approved increasing or reducing the contract amount sufficient to vary actual payments 10 percent or more (plus or minus) from the accepted Payment Schedule.

## **1.6 BASELINE CONSTRUCTION SCHEDULE**

- A. Develop a baseline construction schedule using Primavera SureTrak Project Manager or Primavera Project Planner. Assure the schedule accurately reflects the proposed approach to accomplish the work outlined in the Contract documents and conforms to all requirements of this article.
- B. Use the baseline construction schedule to coordinate all activities on the project - particularly the interaction with other entities, including, but not limited to, utilities, local governments, special service districts, and the Department.
- C. Schedule Submission
  - 1. Within 14 calendar days of the Notice of Award, submit a baseline construction schedule in a Critical Path Method (CPM) format for the Engineer's review and acceptance. Submit one hard copy and one electronic copy in a format acceptable to the Engineer.
  - 2. The Engineer reviews the schedule and returns it, accepted or with comments, within seven calendar days from the date of receipt.
  - 3. If the schedule is returned with comments, address all comments and revise the schedule as necessary to the satisfaction of the Engineer. Complete the final baseline schedule and obtain the acceptance of the Engineer within 30 calendar days from the Notice of Award.
  - 4. No progress payments are made before the Engineer accepts the baseline construction schedule.
  - 5. Develop a 60-calendar day schedule for complex contracts exceeding 120 working days, when not practical to prepare, review, and approve the baseline construction schedule in the time frame specified above. Use the same format as required for the baseline schedule and include all activities worked on during the first 60 calendar days of the Contract. The Engineer reviews and accepts the schedule prior to the approval of the first pay estimate.
  - 6. Acceptance of the baseline construction schedule by the Engineer does not imply approval of any particular construction methods or relieve the Contractor from its responsibility to provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the contract documents.

7. Acceptance of the baseline construction schedule by the Engineer does not attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or any other aspect of the baseline construction schedule. Within the contractual constraints, the Contractor is solely responsible for the planning and execution of the work.
8. Failure by the Contractor to include any element of work required by the Contract in the accepted baseline construction schedule does not relieve the Contractor from its responsibility to perform such work.
9. In no way does the baseline construction schedule modify the contract documents.

D. Schedule Requirements

As a minimum, address the following in the baseline construction schedule:

1. Define a complete logical plan that can realistically be accomplished, for executing the work defined in the Contract.
2. Include sufficient activities to assure adequate planning of the project.
3. Comply with the phasing, work constraints, and milestones defined in the Contract as well as all other contractual terms and conditions.
4. Clearly show the critical path (using the longest path definition) and other critical elements of work. If the schedule is resource loaded and leveled, define the critical path of the schedule based on resource limitations. If an early completion schedule is accepted, the Engineer defines the additional Department cost required to support the accelerated schedule (such as increased staff for inspection and testing, overtime, etc.). The Contractor is responsible for paying these added costs unless waived by the Engineer on the basis of other benefits accrued to the Department.
5. Clearly define significant interaction points between the Contractor, UDOT, and other entities (such as utilities, local governments, special service districts, etc.).
6. Designate the "Data Date" as the day prior to the Notice to Proceed.
7. Include a unique identification number for each schedule activity.
8. Clearly and uniquely define each activity description. Using descriptions referring to a percent complete of a multi-element task (i.e., "Construction 50 percent of Deck") are not acceptable.
9. Define the duration of each activity - limiting the maximum duration of any activity to 15 days unless otherwise accepted by the Engineer.
10. Clearly identify the relationships tying activities together.
11. Do not have any open ended activities (with the exception of one start and one finish activities).
12. Do not have any constrained activities unless the Engineer accepts such constraints.
13. Do not sequester project total float through manipulating the calendars, extending activities durations, or any other such methodology.
14. Use resource loading if resource limitations could affect the prosecution of

the work. No time extensions tied to a shortage of resources will be considered unless the baseline and subsequent schedule updates are resource loaded.

15. Include milestones to define significant contractual events such as Notice to Proceed, Substantial Completion, and coordination points with outside entities such as utilities, special service districts, etc.
16. Include a well-defined activity coding structure that allows project activities to be sorted by total project, responsible party, location of work, type of work, work phase, or as mutually agreed to by the Contractor and the Engineer.
17. Have clearly defined calendars.
18. Include a Narrative that describes:
  - a. The construction philosophy supporting the approach to the Work outlined in the baseline schedule. Address the reasons for the sequencing of work and describe any limited resources, potential conflicts, and other salient items that may affect the schedule and how they may be resolved.
  - b. The justification(s) for activities with durations exceeding 15 working days.
  - c. The justification(s) for constraints used.
  - d. The justification(s) for unusual calendars used.
  - e. The approach used to apply relationships between activities (for example, all ties are based on physical relationships between work activities - rebar must be placed before concrete is poured; or relationships are used to show limited resources - bridge two follows bridge one because the contractor only has one bridge crew; etc.).
  - f. The project critical path and challenges that may arise associated with the critical path.
  - g. How the Contractor intends to coordinate with other entities.

E. Project Float

Total Project Float is defined as the length of time activities can be delayed before they affect the finish date of the project or a contractual milestone.

1. Float is a shared commodity and not for the exclusive use or financial benefit of either party.
2. Either party has the full use of the project float until it is depleted.

F. Prosecution of the Work

Employ a sufficient work force, supply adequate materials and equipment, and prosecute the work with such diligence as to maintain the rate of progress indicated in the accepted baseline construction schedule.

1. Any additional or unanticipated costs required to maintain the schedule is solely the Contractor's obligation and is at no expense to the Department.

## **1.7 CONSTRUCTION SCHEDULE UPDATES**

- A. Update the construction schedule monthly using the closing date for the monthly progress payment and submit to the Engineer.
  - 1. The Engineer does not approve progress payment until the schedule update has been received.
  - 2. Show actual progress for each activity; actual start and finish dates for completed activities; actual start dates, percent complete, and remaining duration for activities in progress; projected sequences of activities for future work; revised relationships and durations for unfinished activities, if warranted; and a well defined critical path.
- B. Submit one hard copy and one electronic copy of the schedule update to the Engineer for review and approval.
- C. Along with the updated schedule, submit a narrative describing:
  - 1. Actual work performed during the estimate period.
  - 2. Any problems or delays that have been experienced to date, the party responsible for the problems or delays, and the Contractor's intentions to resolve the problems or bring the delayed activities back on schedule.
  - 3. Differences between the actual work performed and the work planned for the period, including explanations for the deviations.
  - 4. The current critical path of the project, highlighting any changes to this path since the last update and the impacts of such changes.
  - 5. All added or deleted activities and the reason(s) for and the impact(s) of such changes.
  - 6. All changes in activity durations and the reason(s) for and the impact(s) of such changes.
  - 7. All changes in relationships between activities and the reason(s) for and the impact(s) of such changes.
  - 8. The addition or deletion of constraints and the reason(s) for and the impact(s) of such changes.
  - 9. All changes to the project calendars and the reason(s) for and the impact(s) of such changes.
  - 10. The work to be accomplished during the next period. Provide reasoning for any deviations from the schedule.
  - 11. All potential problems that may be encountered during the next period and the proposed solutions to such problems. Particularly, identify all potential problems the Department may be party to. Explain what action the Department needs to take and the date by which time the action needs to be taken to avoid the problem.
- D. The Engineer conducts a monthly review of the updated construction schedule.
  - 1. This review occurs within one week of the receipt of the Contractor's updated information and serves as the forum to discuss activity slippages,

- remedies, schedule revisions, coordination requirements, change orders, potential Contractor delay claims, and other relevant issues.
2. The Contractor's project manager, scheduler, and appropriate field personnel participate in these reviews.
3. Compile an action item list that describes who is responsible for existing or pending issues and the date by which the issue needs to be resolved to avoid contract delays.
4. Submit a revised schedule update if necessary.

## 1.8 CONSTRUCTION SCHEDULE DELAYS

- A. A construction schedule delay is defined as an event, action, or other factor that impacts the critical path of the construction schedule and extending the time needed to complete the construction project. There are four types of delays:
  1. **Excusable Delay** - An excusable delay is one caused by an unforeseeable event beyond the Contractor's control. Such delays, where the Contractor may be granted added time but no additional money, include, but are not limited to, acts of God, acts of public enemies, fires, floods, area wide strikes, utility conflicts, and unusually severe weather.
  2. **Compensable Delay** - A compensable delay is one solely caused by the Department or its representatives. Such delays include, but are not limited to, Department ordered suspension of the work, design errors, and differing site conditions. Compensable delays may entitle the Contractor to additional time and monetary compensation.
  3. **Inexcusable Delay** - An inexcusable delay is one that the Contractor could have foreseen and prevented but failed to do so. In such cases, the Contractor is responsible for all cost and time impacts resulting from the delay for all parties affected. Examples of events that cause inexcusable delays include weather or failure by the Contractor to assign sufficient resources to the project.
  4. **Non-Critical Delays** - Non-critical delays are delays, regardless of cause, that do not impact the critical path of the project. No added time or monetary compensation is given the Contractor for such delays. If the delay is sufficiently long to eventually place the impacted activity(s) on the critical path of the construction schedule, the time period the delay affects the critical path will be handled as defined above.
- B. Upon determining critical activities have been delayed, provide written notification to the Engineer within seven calendar days of the delay-causing event. Provide detailed information including:
  1. The events that caused the delay.
  2. Party(s) responsible for the events.
  3. Activities in the construction schedule affected by the events.
  4. The magnitude of the delay using the current update of the construction schedule.



- C. The Engineer reviews the request and within 14 calendar days provides a written response to the Contractor. If the Engineer agrees with the request, a time extension and added compensation, if applicable, will be granted under the terms of the Contract.
- D. If the Engineer disagrees with the request, a clear explanation will be included in the letter. This letter serves as formal rejection of the request by the Department.
- E. Once a delay-causing event is identified, take all reasonable steps needed to minimize the impact of the delay. Failure to do so results in the rejection of all or part of the delay claim.

## **1.9 LIMITATION OF OPERATIONS**

- A. Conduct the work to minimize interference with traffic.
- B. Sundays or holidays: Do not perform any work without written approval except repair or servicing of equipment, protection of work, maintenance or curing of concrete, or maintenance of traffic.
- C. Night work:
  - 1. Permission must be granted by the Engineer before any night work can commence.
  - 2. Provide five calendar day's notice before starting night work.
  - 3. Provide adequate lighting for performing satisfactory inspection and construction operations.
  - 4. Control noise and vibration in accordance with Section 01355.
- D. Daily Schedule.
  - 1. Unless special permission is given from the Engineer, a minimum of a single lane controlled, alternating one directional road way for traffic will remain open except during all times except for the following times in which two lanes will remain be open.
    - a. 6:00 AM to 9:00 AM, Sunday through Friday
    - b. 3:00 PM to 7:00 PM, Sunday through Friday
    - c. Saturdays 6:00 AM to 9:00 PM
  - 2. The Contractor will be prepared to open 300 West to two lanes of traffic no later than one-half of one hour before the required times listed.
- D. Utilities Coordination:
  - 1. Provide notification to the utilities listed below before any construction impacts the utility in accordance to the schedule shown.
  - 2. Provide notification to the utilities listed below to allow coordination and planning between the utility company and the Contractor in accordance o the schedule shown.

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<b>Utility</b>	<b>Utility Company</b>	<b>Contact</b>	<b>Phone Number</b>	<b>Days Notification before construction impact</b>	<b>Months Notification prior to Utility Direct Involvement</b>
Blue Stakes	-	-	1-800-622-4111	-	-
Power	Utah Power	Curtis Galvez	(801) 629-4318	3	3
Fiber Optics	XO Communications	Kirk Hansen	801-983-1712	3	3
Phone	Qwest	Jeff Stapley	(801) 974-8505	3	3
Cable	Comcast	Tyson Stone	(801) 401-3058	3	3
Irrigation	Pine View Water	Mark Greenhalgh	(801) 621-6555	3	3
Gas	Questar Gas	Joe Johnson	(801) 395-6781	42	6*
Water Sanitary Sewer, Fire, Storm Drain	Riverdale City	Lynn Moulding	(801) 394-4451	3	Coordination through Engineer
Water Sanitary Sewer, Fire, Storm Drain	City of Washington Terrace	Randy Drummond	(801) 393-1047	3	Coordination through Engineer

\*Utilities have been contacted and briefed February 2005

### 1.10 CHARACTER OF WORKERS

- A. Provide sufficient resources to complete all work in accordance with the Contract and employ workers with the skills and experience necessary to perform the work.
- B. Remove any person employed who performs the work in an improper or unskilled manner, or who is intemperate or disorderly. Rehire these employees only with the Engineer's written permission.
- C. Failure to remove any employee(s) or to furnish suitable and sufficient personnel to perform the work may result in a written notice to suspend the work.

### 1.11 METHODS AND EQUIPMENT

- A. Use equipment of the size and mechanical condition to perform and produce the specified work.
- B. Do not damage the roadway, adjacent property, or other highways.
- C. Use methods or equipment other than those specified only with the Engineer's written permission.
  - 1. Describe in writing the proposed methods and equipment to be used and the reasons for the change.
  - 2. Once approval is received, produce work meeting project requirements.
  - 3. Discontinue use of alternate methods or equipment if the Engineer determines that the work does not meet contract requirements.
  - 4. Remove and replace or repair deficient work to return it to specified quality at no cost to the Department.
  - 5. Department does not change the basis of payment for a change in methods or equipment.

#### 1.12 CONTRACT TIME

- A. Contract time begins 10 Calendar days after the date of the Notice to Proceed, unless otherwise specified.
- B. The Contract Documents define the time allowed to complete the Contract. Contract time is measured in either Working Days or Calendar Days as defined in Section 00570.
  - 1. Department excludes Calendar days elapsing between the effective dates of any orders of the Engineer to suspend and resume work that are not the fault of the Contractor.
  - 2. Completion Date: The date when the Contract work is specified to be Substantially Complete.
- C. The Engineer furnishes a Monthly Status of Contract Time showing the number of days expended to date and the number of days remaining for Substantial Completion.
  - 1. This statement is considered correct unless a written protest documenting the differences is submitted to the Engineer within 10 calendar days of the schedule update review meeting.
  - 2. Immediately resolve any differences with the Engineer.
- D. **Substantial Completion** - the day, determined by the Engineer, when all of the following have occurred:
  - 1. The public (including vehicles and pedestrians) has full and unrestricted use and benefit of the facilities both from the operational and safety standpoint, and

2. All safety features are installed and fully functional, including, but not limited to, illumination, signing, striping, barrier, guard rail, impact attenuators, delineators, and all other safety appurtenances, and
  3. Only minor incidental work, replacement of temporary substitute facilities or correction or repair remains for the Physical Completion of the Contract, and
  4. The Contractor and Engineer mutually agree that all work remaining will be performed without lane closures, trail/sidewalk closures, or further delays, disruption, or impediment to the public.
- E. **Physical Completion** - the day, determined by the Engineer, when all construction work required by, or incidental to, the Contract (including all punch list work, final cleanup, and demobilization) is physically completed and the only outstanding obligation under the Contract is the submittal or processing of documentation.
- F. **Contract Completion** - the day, determined by the Engineer, when all work specified in the Contract is completed and all obligations of the Contractor under the Contract are fulfilled.
1. Furnish all documentation required by the Contract and required by law before this date.
- F. **Contract Start and Completion** – The awarded Contractor will be granted the Notice to Proceed to commence Work February 1, 2006. The Contractor will complete Work within Two hundred Seventy-three (273) calendar days. The date of completion of all Work is therefore November 1, 2006.

### 1.13 EXTENDING CONTRACT TIME

- A. Request additional contract time as part of project change orders covering quantity overruns, extra work requested by the Department, suspensions of work, and other excusable delays.
1. Time added to Calendar Day and Completion Date contracts is in calendar days.
  2. Time added to Working Day contracts is in working days.
- B. Provide a narrative clearly explaining the cause and duration of the delay.
1. Support the narrative with a project schedule delay analysis showing the overall project critical path and substantial completion date is negatively affected by the number of days requested.
    - a. Base the schedule analyses on the most current project schedule update.
    - b. Explain any changes made to the schedule in the analysis.
    - c. Include an explanation of the addition or deletion of activities,

modified activity durations, changes in activity relationships and constraints, and any other change that contribute to the schedule delay.

- C. Partial Suspension: Suspension of work on some items as ordered by the Engineer is considered a partial suspension.
  - 1. Applicable only to working day or calendar day contracts.
  - 2. Engineer determines the time charged for each day on partial suspensions not the fault of the Contractor as the greater of:
    - a. 0.15 day
    - b. The quotient (rounded to hundredths) obtained by dividing the sum of the bid amount for the specific items of work not suspended by the total value of original contract amount.

#### 1.14 FAILURE TO COMPLETE ON TIME

- A. Achieve Substantial Completion within the required Contract Time. Department deducts from any money due the sum specified in the following Schedule of Liquidated Damages (Table 1) for each calendar day or working day that any work remains necessary to achieve Substantial Completion after the Substantial Completion date.
- B. Achieve Physical Completion no later than 30 calendar days after achieving Substantial Completion. Department deducts from any money due \$210.00 per day for each calendar day after the 30 days following Substantial Completion any work remains necessary to achieve Physical Completion.
- C. Achieve Contract Completion no later than 30 calendar days after achieving Physical Completion. Department deducts from any money due \$100.00 per day for each calendar day after the 30 days following Physical Completion any obligation of the Contractor under the Contract remains unfulfilled.

**Table 1 - Schedule of Liquidated Damages**

Original Contract Amount		Daily Charge	
From more than	To and including	Calendar Day Completion Date	Work Day
\$0	\$100,000	\$210	\$830
100,000	500,000	450	950
500,000	1,000,000	680	1380
1,000,000	5,000,000	1270	2170
5,000,000	10,000,000	1860	2950
10,000,000	30,000,000	2770	4930
30,000,000		4100	8240

- D. Continuation and completion of the work after the contract time expires does not waive the Department's rights under the Contract.

### **1.15 TERMINATION FOR DEFAULT**

- A. Termination can occur if the Contractor:
  - 1. Fails to begin the work under the Contract within the time specified.
  - 2. Fails to perform the work with sufficient resources to assure the prompt completion of the work.
  - 3. Fails to perform the work in accordance with the Contract requirements or neglects or refuses to remove and replace rejected materials or unacceptable work.
  - 4. Discontinues the prosecution of the work.
  - 5. Fails to resume work within the time specified upon notification from the Department.
  - 6. Becomes insolvent, or is declared bankrupt, or commits any act of insolvency or bankruptcy.
  - 7. Allows any final judgment to remain unsatisfied for a period of 10 calendar days.
  - 8. Makes an assignment for the benefit of creditors without the Department's approval.
  - 9. Fails to comply with Contract requirements including minimum wage payments or EEO requirements.
  - 10. Is a party to fraud.
- B. The Engineer may declare the Contract in default by written notice to the Contractor and the Surety advising them of the actions required for remedy.
- C. Comply with the written notice within 10 calendar days of receipt or the Department has full power and authority to terminate the Contract.
- D. The Department may appropriate or use any or all materials and equipment at the project site and enter into another contract for completion of the work according to the terms and provisions thereof, or use such methods as determined by the Department to complete the Contract.
- E. All costs and charges incurred by the Department, including the cost of completing the work under the Contract, are deducted from monies owed or that may be owed the Contractor. Should the expense exceed the sum that would have been payable under the Contract, the Contractor and Surety are liable and must pay the Department the amount of the excess.

- F. If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Department.

#### **1.16 TERMINATION OF CONTRACT FOR CONVENIENCE OF THE DEPARTMENT**

- A. The Department may by written order terminate the Contract or any portion thereof after determining that for reasons beyond the Contractor's or the Department's control, the Contractor is prevented from proceeding with or completing the work and that termination would be in the public interest.
- B. Reasons for termination may include, but are not limited to:
  - 1. Executive Orders of the President relating to prosecution of war or national defense.
  - 2. National emergency that creates a serious shortage of materials.
  - 3. Orders from duly constituted authorities relating to energy conservation.
  - 4. Restraining Orders or Injunctions obtained by third-party citizen action resulting from national or local environmental protection laws or where the issuance of such order or injunction is primarily caused by acts or omissions of persons or agencies other than the Contractor.
- C. When the Department orders termination of a Contract effective on a certain date, the Department pays for all completed items of work as of that date at the Contract bid price.
  - 1. Department pays for partially completed work either at agreed prices or by force account methods.
  - 2. Department pays for items that are eliminated in their entirety in accordance with Section 01282.
- D. Materials obtained by the Contractor that have not been incorporated into the project may be:
  - 1. Purchased from the Contractor at the option of the Department at actual cost delivered to a prescribed location.
  - 2. Disposed of as mutually agreed.
- E. Contractor may submit a claim for additional costs not covered in the Contract after receipt of Notice of Termination from the Department.
  - 1. Submit within 60 calendar days of the effective termination date.
  - 2. Include cost items such as:
    - a. Reasonable idle equipment time
    - b. Mobilization efforts
    - c. Bidding and project investigative costs

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- d. Overhead expenses attributable to the project terminated
  - e. Reasonable profit on work completed
  - f. Subcontractor costs not otherwise paid for
  - g. Actual idle labor cost if work is stopped in advance of termination date.
  - h. Guaranteed payments for private land usage as part of original Contract
  - i. Any other direct cost the Contractor has incurred
- 3. The negotiated settlement figure reached with the Contractor does not include loss of anticipated profits.
- F. Make cost records available to the Department for determining the validity and amount of each item claimed, and for providing a basis for negotiating an equitable settlement.
- G. Termination of a Contract or portion thereof does not relieve the Contractor of contractual responsibilities for the work completed, nor does it relieve the Surety of its obligation for and concerning any just claim arising out of the work performed.

**PART 2      PRODUCTS      Not used**

**PART 3      EXECUTION      Not used**

END OF SECTION



March 29, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 00725M**

**SCOPE OF WORK**

**Add the following to article 1.18 Paragraph C:**

1. The Department does not accept VE proposals related to pavement section structure, strength or performance.

**Delete article 1.18 Paragraph D and replace with the following:**

- D. The Department rejects proposals that provide equivalent options to those already in the contract.

**Continued on next page.**

**Delete article 1.18 Paragraphs E – I and replace with the following:**

- E. The Department may reject proposals that:
  - 1. Contain revisions the Department is already considering or has approved for the Contract.
  - 2. Do not generate sufficient savings.
  - 3. Do not provide additional information as requested by the Department including requests for field investigation results and surveys, design computations, and field change sheet for proposed design changes.
- F. If the proposal is rejected, the Contractor has no claim to additional costs or delays, including development costs, loss of anticipated profits, or increased material or labor costs.
- G. The Engineer can reject all unsatisfactory work resulting from an approved proposal.
  - 1. Remove rejected work and reconstruct under the original contract provisions at no additional cost to Department.
  - 2. Reimbursement for modifications to the proposal to adjust field or other conditions is limited to the total amount of the contract bid prices.
  - 3. Rejection or limitation of reimbursement is not basis for any claim against the Department.
- H. The Department does not consider savings generated by contingency items when it is reduced as part of a VECP, unless it can be tied to a reduction in contract time.

END OF SECTION

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 00820M**

**LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC**

**Delete Article 1.16 and replace with the following:**

**1.16 INSURANCE REQUIREMENTS**

- A. Workers' Compensation Insurance
  - 1. Provide Workers' Compensation Insurance to cover full liability. As a minimum, comply with the statutory limits defined by the State of Utah.
- B. General Liability Insurance
  - 1. Provide General Liability insurance with the following minimum limits of liability:
    - a. \$1,000,000 Bodily Injury and Property Damage – Each Accident
    - b. \$2,000,000 General Aggregate
    - c. \$2,000,000 Products and Complete Operations Annual Aggregate
- C. Excess General Liability Insurance
  - 1. Provide Excess Liability Insurance with the following minimum limits:
    - a. \$1,000,000 Each Claim
- D. Automobile Liability Insurance
  - 1. Provide Automobile Liability Insurance for claims arising from the ownership, maintenance, or use of motor vehicles involved in project work with the following minimum limits:
    - a. \$1,000,000 Combined single Limit Bodily Injury and Property Damage per Occurrence
- E. Provide the following for all required liability insurance policies:
  - 1. Where and when applicable, name as insured, only in respect to work to be performed under this Contract, the State of Utah and all institutions, agencies, departments, authorities, and instrumentalities, and while acting within the scope of their duties, all volunteers as well as members of governing bodies, boards, commissions, and advisory committees.
  - 2. Coverage for the above insured is primary and not contributing.
  - 3. Incorporate into the insurance policy this statement: "Insurance coverage is extended to include claims reported up to one year beyond the date of substantial completion of this Contract."

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- F. Provide UDOT with certificates of insurance showing coverage as required above at the time the contract is executed and maintain the policy in force during the entire period of the Contract. The certificates will also state that the policies required are endorsed to give UDOT (the Engineer) not less than 30 days prior notice in the event of cancellation or change in coverage.
- G. Regardless of the Contractor insurance requirements required in this section, insolvency, bankruptcy, or failure of any insurance company to pay all claims accrued does not relieve Contractor of any obligations.
- H. Endorse all policies to include waivers of subrogation in favor of UDOT.

**END OF SECTION**

August 25, 2005

**SPECIAL PROVISION**

**PROJECT # STP-3328(1)0**

**SECTION 01280M**

**MEASUREMENT**

**Delete Article 1.3 and replace with the following:**

**1.3 GENERAL MEASUREMENT OF QUANTITIES**

- A. All work completed under the Contract is measured in U. S. Standard measure.
- B. The methods of measurement and computations for determining quantities of material furnished and of work performed under the Contract are methods generally recognized as conforming to good engineering practice.
- C. The Department measures and determines quantities of material furnished and work performed.
- D. When the plan quantities for a specific portion of the work are designated to be the pay quantities for the Contract:
  - 1. They are the final quantities for which payment for such specific portion of the work will be made, unless the Engineer revises the plan dimensions.
  - 2. If revised dimensions result in an increase or decrease in the quantities of work, Department will revise the final quantities for payment in the amount represented by the authorized changes in the dimensions.
- E. When requesting additional compensation on the basis of adjustment to quantities in the bid proposal for items paid as "plan quantity," provide all computations, plots, and supporting documentation necessary for the Engineer to evaluate and verify adjusted quantities.
  - 1. All work associated with providing computations, plots, and supporting documentation is at no cost to the Department, except:
    - a. When the Engineer revises plan dimensions. Refer to Section 01280.
    - b. When the adjusted quantity differs from the plan quantity by more than 10 percent, work required to provide computations, plots, and supporting documentation will be paid for as extra work.
- F. Measurements for area computations:
  - 1. Longitudinal measurements: made horizontally.

2. Transverse measurements: the neat dimensions shown on the plans.
- G. Computing volumes of excavation: Average end area method, or computer generated Digital Terrain Model (DTM) method, unless the Engineer and Contractor agree in writing to an alternate method.
- H. Measure complete structure or structural unit, signal or lighting system, (“lump sum” work) unit to include all necessary fittings and accessories.
- I. Structures: Neat lines shown on the plans or as altered to fit field conditions.
- J. Standard manufactured items (fence, wire, plates, rolled shapes, pipe conduit, etc.), are identified by gauge, unit, weight, section dimensions, etc.
  1. Identification will be nominal weights or dimensions.
  2. Use industry-manufacturing tolerances, unless more stringently controlled by specifications.
- K. Items measured by the foot, (pipe culverts, guardrail, underdrains, etc.): measure parallel with the base or foundations upon which structures are placed.
- L. The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing: measured in fractions of inches.
- M. Materials specified to be measured by the cubic yard may be weighed and converted to cubic yard for payment purposes, when requested by the Contractor and approved by the Engineer in writing. Engineer determines and Contractor agrees to the factors for conversion from weight measurement to volume before this method of measurement of pay quantities is used.
- N. Rental of equipment: measure hours of actual working time and necessary traveling time of the equipment within the limits of the project.
  1. If the Engineer orders special equipment in connection with force account work, the Department measures travel time and transportation to the project.
  2. If the Engineer orders equipment held on the project on a standby basis, the Department pays the agreed rental rate minus the operating cost.

**Delete Article 1.10**

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**PROJECT # STP-3328(1)0**

**SECTION 01282M**

**PAYMENT**

**Add the following to Part 1, Article 1.1:**

D. Section 01284: Prompt Payment

**Delete Article 1.14, paragraph E and replace with the following:**

- E. From the total value of work, the Department deducts and retains five percent until after the entire Contract has been completed in an acceptable manner, with the following exceptions:
  - a. Retention for subcontracted work paid upon satisfactory completion and acceptance by the Department. Refer to Section 01284.
  - b. When no less than 95 percent of the work has been completed, and with the consent of the Surety, the Engineer may prepare a semi-final estimate from which the Department retains 1½ percent of the original contract amount. The Department certifies the remainder for payment, less all previous payments.

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**SECTION 01284**

**PROMPT PAYMENT**

**Add Section 01284:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      This section applies only to Federal-Aid Contracts.
- B.      Requirements applicable to Contractors, subcontractors, service providers, material suppliers, and all tier subcontractors, service providers, and suppliers.

**1.2      PROGRESS PAYMENTS**

- A.      Include in subcontract, service, or purchase agreement language agreeing to pay promptly as required by this specification.
- B.      Pay subcontractors for satisfactory performance of sublet work, no later than 10 working days after receipt of payment by the Department.
  - 1.      Certify that payment has been made to all subcontractors for the work performed and paid for on the most recent Department pay estimate.
  - 2.      Provide documentation showing Department estimate number, bid item, quantities, and dollar amounts paid to subcontractors, including payments for contract bid items that are partially sublet.
- C.      Pay Material Suppliers and Service Suppliers within 30 calendar days after receipt of payment for work that includes materials and or services.
- D.      Submit the following to the Engineer within five working days after paying subcontractor(s), service provider(s), or material supplier(s):
  - 1.      A certified statement in the form of an affidavit on letterhead, including the signature of a legally responsible official, certifying:



- a. That payment of the total dollar amount paid to each entity has been made in accordance with all requirements of the contract and special provisions, and
- b. That the dollar amount paid is the total amount due for work or services performed or materials purchased through the most current pay estimate.

### **1.3 RETAINED MONEY**

- A. Include in subcontract, service, or purchase agreement language agreeing to pay retained money for subcontract, service, or purchase agreement upon satisfactory completion of the work and acceptance by the Department.
- B. For purposes of this Section, a subcontractor's work is considered satisfactorily completed when all work included in the subcontract is complete, in accordance with all requirements of the contract, and documented as required by the recipient. When a recipient has partially accepted a portion of the work, that portion of work performed is considered to be satisfactorily completed.
- C. Require written notification from the subcontractor when all subcontract items are complete.
  - 1. Notify the Engineer in writing within two working days after written notification from the subcontractor.
  - 2. The Engineer schedules and coordinates an inspection for acceptance of the work within three working days.
  - 3. Receive notification from the Department in writing when the work is considered to be satisfactorily complete and accepted. Acceptance of the work includes all requirements of the contract and agreement on pay quantities.
  - 4. Upon acceptance of the work, the Department releases an amount equal to the subcontractor's retainage. Submit to the Engineer a certified statement:
    - a. In the form of an affidavit on letterhead, including the signature of a legally responsible official, and the signature of a legally responsible official for the subcontractor, certifying that the total amount due is the total retention.
- D. Pay retained money owed to the subcontractor for satisfactory completion of the accepted work no later than 30 calendar days after receipt of payment from the Department.

- E. Submit to the Engineer within five workdays after making payment a certified statement:
  - 1. In the form of an affidavit on letterhead, including the signature of a legally responsible official, certifying that the total amount paid is the total amount of retained money paid.
- F. A determination of satisfactory completion and payment of retained money does not relieve any contractual obligation.

#### **1.4 DELAY OF PAYMENT**

- A. Delay payment only for cause, with prior written notice to all parties, to include the Department.
- B. Provide subcontractor 10 working days from date of written notification to correct deficiencies.
  - 1. Release payment upon receipt of documentation demonstrating correction of deficiencies within 10 working days.
- C. Engineer may withhold dollar amount of delayed payment from future estimates.
- D. Include in subcontract, service, and purchase agreements, language providing for the use of appropriate alternative dispute resolution mechanisms to resolve time of payment disputes.
- E. Department may hold disputed funds in escrow until the dispute is resolved.

#### **1.5 LIQUIDATED DAMAGES**

- A. Upon determination by the Department of failure to make prompt payment the Engineer will provide written notification to the Contractor. Resolve the failure and make prompt payment within three working days.
- B. Failure to resolve prompt payment results in the assessment of \$250 per each working day, per violation, commencing from the date of the written notification until proof of payment is received.
- C. Proof of payment is defined as providing confirmation from the subcontractor that payment has been received.

- D. Department considers the failure to make prompt payment an indication of a lack of financial fitness. The following additional measures may be imposed as necessary:
  - 1. Forfeit the privilege of bidding on Department projects until payment covered by this Section is made.
  - 2. Forfeit the privilege of having a subcontract, supply or purchase agreement approved to perform work or supply materials on Department projects until payment covered by this Section is made.
- E. Department employs other mechanisms, consistent with this Section and applicable state and local law, so payment is fully and promptly made.

#### **1.6 CONTRACTOR INCENTIVE ENTITLEMENT**

- A. Two hundred fifty dollars will be paid to Prime Contractor for each subcontractor provided the following criteria is met:
  - 1. Worked on the project.
  - 2. All prompt payment statements submitted to the project office within five working days after payment to subcontractors.
  - 3. Department received no valid complaints regarding prompt payment.
  - 4. Payment within 30 days after project has reached physical completion.

**PART 2      PRODUCTS      Not used**

**PART 3      EXECUTION      Not used**

END SECTION

**SPECIAL PROVISIONS**

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**SECTION 01300S**

**ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Progress videotapes and photographs.
- B. Coordination drawings.
- C. Submittals for review, information, and project closeout.
- D. Number of copies of submittals.
- E. Submittal procedures.

**1.02 RELATED SECTIONS**

- A. Document 00555M – Preconstruction and Progress.

**1.03 PROJECT COORDINATION**

- A. Project Coordinator: Engineer Employed Inspector.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for project access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

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E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to the Engineer through the Project Coordinator:

1. Requests for interpretation.
2. Requests for substitution.
3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Closeout submittals.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 PROGRESS VIDEOTAPES AND PHOTOGRAPHS**

A. Provide video tapes and 35mm photographs of construction throughout progress of Work produced by an experienced photographer, acceptable to City Inspector and Engineer.

B. Take photographs when and as directed by the Inspector or Engineer and as follows:

C. Views:

1. Video tape and photographs shall show total project, from end to end, prior to start of work and after work has been completed; with additional footage or photographs to portray special items of interest and unusual conditions.

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2. Consult with Inspector or Engineer for instructions on views required to adequately show original conditions. No work shall be started until original conditions are adequately shown.

3. Provide factual presentation.

4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

D. Video Tapes: VHS format; two copies.

1. Video tapes shall include narration to identify date, locations, and indicating special items of interest.

E. Prints: Full color; two prints of each view.

1. Glossy; smooth texture; white tint; single weight; high contrast.

2. Size: 3 1/2 x 5 inch; mounted for binder and tabs.

3. Identify each print on back. Identify name of Project, contract number, phase, orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.

F. Deliver video tapes at end of project, or when directed by the Inspector or Engineer, with transmittal letter specified in this section.

G. Deliver prints with each Application for Payment with transmittal letter specified in this Section.

H. Deliver negatives to Owner with project record documents. Catalog and index negatives in chronological sequence; provide typed table of contents.

### **3.02 COORDINATION DRAWINGS**

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to Engineer.

### **3.03 SUBMITTALS FOR REVIEW**

A. When the following are specified in individual sections, submit them for review:

1. Product data.

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2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 - CLOSEOUT SUBMITTALS.

### **3.04 SUBMITTALS FOR INFORMATION**

A. When the following are specified in individual sections, submit them for information:

1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for the Engineer's knowledge as contract administrator or for the Owner. No action will be taken.

### **3.05 SUBMITTALS FOR PROJECT CLOSEOUT**

A. When the following are specified in individual sections, submit them at project closeout:

1. Project record documents.
2. Operation and maintenance data.
3. Warranties.

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4. Bonds.
5. Other types as indicated.

B. Submit for the Owner's benefit during and after project completion.

### **3.06 NUMBER OF COPIES OF SUBMITTALS**

A. Documents for Review:

1. Small size sheets, not larger than 8-1/2 x 11 inches: Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer.
2. Larger sheets, not larger than 36 x 48 inches: Submit the number of opaque reproductions which Contractor requires, plus two copies which will be retained by Engineer.

B. Documents for Information: Submit two copies.

C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.

D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Engineer.

1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

### **3.07 SUBMITTAL PROCEDURES**

A. Transmit each submittal with transmittal letter.

B. Sequentially number the transmittal letters. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply Contractor 's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Deliver submittals to Engineer at business address.

F. Schedule submittals to expedite the Project, and coordinate submission of related items.



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G. For each submittal for review, allow 7 days excluding delivery time to and from the Contractor.

H. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

I. Provide space for Contractor and Engineer review stamps.

J. When revised for resubmission, identify all changes made since previous submission.

K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

**END OF SECTION**

**Supplemental Specification  
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**SECTION 01452M**

**PROFILOGRAPH AND PAVEMENT SMOOTHNESS**

**Delete Article 3.1, paragraph B1 and replace with the following:**

1. Incentive/Disincentive applies only to Class I surfaces for each pavement section defined in this Section, Article 1.5, paragraph B.
  - a. Incentive/Disincentive is calculated according to Table 2, with partial sections prorated based on length.
  - b. Incentive/Disincentive does not apply to HMA surfaces on projects requiring OGSC or SMA.
  - c. Any section requiring grinding exceeding 20 yd<sup>2</sup> does not qualify for incentive. Disincentive remains applicable for sections where grinding exceeds 20 yd<sup>2</sup>.

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**SECTION 01571**

**TEMPORARY ENVIRONMENTAL CONTROLS**

**Delete Section 01571 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Requirements for controlling erosion on the construction site and diminish the amount of sediment leaving the site, and related areas under the Contractor's control.
- B.      Requirements for installing, maintaining, and removing temporary erosion control measures.

**1.2      RELATED SECTIONS**

- A.      Section 01574: Environmental Control Supervisor
- B.      Section 02373: Riprap
- C.      Section 02610: Pipe Culverts
- D.      Section 02613: Culvert End Sections
- E.      Section 02922: Seed, Turf Seed, and Turf Sod

**1.3      REFERENCES**

- A.      AASHTO M 288: Geotextile Specifications for Highway Applications.
- B.      Storm Water Pollution Prevention Plan (SWPPP)

## 1.4 TYPES

Refer to EN series Standard Drawings for all types.

- A. Check Dam:
  - 1. A temporary fiber roll or stone structure that is placed across a ditch to intercept and pond sediment-laden runoff, thereby reducing the water velocity and allowing suspended sediment to settle. Constructed so water will flow over a low point in the middle of the dam and not around the sides.
- B. Silt Fence:
  - 1. A geotextile fabric fence installed to intercept and pond sediment-laden sheet flow runoff allowing suspended sediment to settle.
- C. Slope Drain:
  - 1. A polyethylene pipe placed on a slope that collects and transports storm runoff down the face of a slope and is used until permanent drainage facilities are installed or vegetation growth is adequate.
- D. Temporary Berm:
  - 1. A ridge of compacted soil, with or without a shallow ditch that diverts storm runoff from a recently constructed slope to a controlled release point.
- E. Drop-Inlet Barrier:
  - 1. A fiber roll, silt fence, or stone barrier placed around a drop-inlet that intercepts and ponds sediment-laden runoff allowing suspended sediment to settle. If the pond height reaches the top of the barrier, water flows over the barrier and into the drop-inlet.
- F. Pipe Inlet Barrier:
  - 1. Consists of a horseshoe-shaped barrier protecting a pipe inlet that intercepts and ponds sediment-laden runoff before it enters a pipe allowing suspended sediment to settle.
- G. Curb Inlet Barrier:
  - 1. A protective barrier placed across a curb inlet that intercepts and ponds sediment-laden runoff before it enters a curb inlet.
- H. Sediment Trap:
  - 1. An excavated basin, usually installed at low points on a construction site, that intercepts and ponds sediment-laden concentrated flows allowing suspended sediment to settle.

- I. Stabilized Construction Entrance:
  - 1. A layer of rock placed at a construction site entrance that removes mud from vehicle tires before they leave the construction site and drive onto a paved road.
- J. Straw Bale Barrier:
  - 1. Consists of straw bales butted end to end and used in active construction areas where a silt fence would fail. Installed to intercept and pond sediment-laden sheet flow runoff allowing suspended sediment to settle.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. Check dams:
  - 1. Fiber Roll:
    - a. Fiber Roll: Contact Engineer for Approved Products List of Fiber Roll Products. Approved list is updated annually.
    - b. Wood stakes: commercial quality lumber 2-inch square (nominal) by 3 feet.
    - c. Channel Liner: Contact Engineer for Approved Products List of Channel Liners. Approved list is updated annually.
  - 2. Stone: Well-graded within 2 to 6 inches in diameter.
- B. Silt Fence:
  - 1. Silt Fence Fabric: See AASHTO M 288 (Table 6 – Temporary Silt Fence Property Requirements).
  - 2. Wood Post: commercial quality lumber, 2-inch square (nominal) by 4 feet in length.
  - 3. Fasteners: Staples, wire, zip ties, or nails sufficient to maintain the fabric's attachment to post.
- C. Slope Drain:
  - 1. Pipe Culverts: Refer to Section 02610.
  - 2. End Section: Refer to Section 02613.
  - 3. 9-inch Loose Riprap: Refer to Section 02373.
  - 4. Wooden stakes: commercial quality lumber 2-inch square (nominal) by 3 feet.
- D. Temporary Berm:
  - 1. Existing Soil.

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- E. Drop-Inlet Barriers:
  - 1. Fiber Roll: Refer to this Section.
  - 2. Stone: Well-graded within 2 to 6 inches diameter.
  - 3. Silt-Fence: Refer to this Section.
    - a. Wood stud: 2 inches x 4 inches (nominal).
- F. Pipe Inlet Barrier:
  - 1. Stone: Well-graded within 2 to 6 inches in diameter.
- G. Curb Inlet Barrier:
  - 1. Concrete Building Blocks.
  - 2. Stone: Well-graded within 2 to 6 inches diameter
  - 3. Wire Mesh: 0.5 inch by 0.5 inch openings.
  - 4. Wood stud: 2 inches x 4 inches (nominal).
- H. Sediment Trap:
  - 1. 9-inch Loose Riprap: Refer to Section 02373.
- I. Stabilized Construction Entrance:
  - 1. Stone: Well-graded within 2 to 3 inches in diameter.
- J. Straw Bale Barrier:
  - 1. Standard Straw Bales: Obtained from weed free fields that have been certified by the Utah Department of Agriculture.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Follow the Storm Water Pollution Prevention Plan (SWPPP) in the plan set.
  - 1. Address in the SWPPP all disturbed areas on a project including staging areas, haul roads, borrow sites, stockpiles, and disposal areas.
  - 2. If SWPPP is not provided in the plans, create and submit a plan to the Engineer for approval.
  - 3. Obtain written approval from the Engineer to change the SWPPP.
- B. Designate an Environmental Control Supervisor (ECS) who will:
  - 1. Work directly with the Department SWPPP coordinator designated by the Engineer.
  - 2. Be available as needed to coordinate the SWPPP, inspect and maintain sediment control devices, and resolve other issues.
- C. Do not start earth-disturbing work until SWPPP is approved, and appropriate temporary erosion and sediment control measures are in place.

- D. Use the most restrictive requirement if a conflict occurs between erosion and sediment control specifications and federal, state, or local agency's laws, rules, or regulations.

### **3.2 INSTALLATION**

- A. Provide or construct measures such as check dams, silt fence, slope drains, drop-in inlet barriers, sediment traps, and other erosion control devices or methods to reduce erosion and sedimentation during construction or shutdown periods.
- B. Follow installation procedures outlined in the EN Series Standard Drawings.

### **3.3 INSPECTIONS**

- A. Inspect all denuded areas during construction to determine potential erosion problems. Pro-actively apply corrective measures in a timely manner as required.
- B. Inspect all sediment retention structures. Refer to Section 01574.

### **3.4 MAINTENANCE**

- A. Maintain temporary sediment control devices to ensure they function properly until all disturbed areas draining to them are stabilized.
- B. Remove and properly dispose of sediment when it has accumulated half way up the overall structure height or it interferes with the performance of the structure.
- C. Dispose of sediment removed from erosion control structures in a manner acceptable to the Engineer.

### **3.5 REMOVAL**

- A. All costs associated with Removal are incidental to other items of work and no separate measurement or payment will be made.
- B. After all seeding and mulching has been placed and just before final closeout of the project, remove any remaining sediment from behind and around erosion control features and remove all temporary erosion control features unless directed differently by the Engineer.
- C. Seed areas where the sediment was removed following Section 02922.

END OF SECTION



**SPECIAL PROVISIONS**

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**SECTION 01600S**

**PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.

**1.02 RELATED SECTIONS**

- A. Document 01280 - Measurement
- B. Section 01282 – Payment

**1.03 SUBMITTALS**

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

- 1. Submit within 15 days after date of Agreement.
- 2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

- C. Shop Drawing Submittals: Prepared specifically for this Project.

D. Provide written statement that materials and equipment being furnished are suitable and proper for the intended installations; that suppliers have investigated intended uses; and that items will satisfactorily perform and operate in the installations.

## **PART 2 PRODUCTS**

### **2.01 PRODUCTS**

A. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

B. Provide interchangeable components of the same manufacture for components being replaced.

### **2.02 PRODUCT OPTIONS**

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION PROCEDURES**

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Engineer will consider requests for substitutions only within 15 days after date of Agreement.

C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

E. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.

2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse Owner and Engineer for review or redesign services associated with re-approval by authorities.

F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

G. Substitution Submittal Procedure:

1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Engineer will notify Contractor in writing of decision to accept or reject request.

### **3.02 TRANSPORTATION AND HANDLING**

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

### **3.03 STORAGE AND PROTECTION**

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.
- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.

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E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

F. Store loose granular materials on relatively solid, flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02312S**

**TRENCHING FOR PIPE WORK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Excavating, backfilling and compacting for project pipe lines.

**1.02 RELATED SECTIONS**

- A. Section 0231S - Structural Excavation: Excavating for miscellaneous structures.
- B. Section 02316S - Fill and Backfill: Backfilling for project pipe lines and at structures.

**1.03 REFERENCES**

- A. Use latest issue of the reference standards as of the date of the project.
- B. AASHTO T 99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and an 12-in. (305 mm) Drop; 1992 (Interim).
- C. AASHTO T 180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop; 1992 (Interim).
- D. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 1996a.
- E. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)); 1991.
- F. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 1990 (Reapproved 1996).
- G. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN m/m<sup>3</sup>)); 1991.

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- H. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994.
- I. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System); 1993.
- J. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1991.
- K. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1988 (Reapproved 1993).
- L. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 1995a.
- M. Specification for Excavating on State Highways, latest edition.
- N. General Safety Orders Covering Utah Industries - Section 69, Trenches.
- O. United States Department of Labor OSHA Publication 2085 - "Employer - Employee, Safe Practice for Excavation and Trenching Operations".
- P. Utah Occupational Safety and Health Rules and Regulations - General Standard (UOSHA).

### **1.04 DEFINITIONS**

- A. Pipe Line Grades and Elevations: Indicated on drawings.
- B. Trench Cross Sections: Indicated on standard trench detail drawings.
- C. Subgrade Elevations: Bottom of road base in paved areas, as indicated on drawings.
- D. Finish Grade Elevations: Top of pavement in paved areas, as indicated on drawings.
- E. Ground Elevations: Indicated on the drawings.

### **1.05 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Samples, where required by the Engineer: 10 lb. sample of each type of fill; submit to testing laboratory as directed by the laboratory.
- C. Materials Sources: Submit name of imported materials source.

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- D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- E. Compaction Density Test Reports.

### **1.06 PROJECT CONDITIONS**

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where designated, as acceptable to the Engineer.
  - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
  - 2. Prevent contamination.
  - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the Work are as indicated.
- D. Protect plants, lawns, and other features to remain.
- E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, curbs, and other improvements from excavating equipment and vehicular traffic.

## **PART 2 PRODUCTS**

### **2.01 FILL MATERIALS**

- A. See Section 02316S - Fill and Backfill.

### **2.02 SOURCE QUALITY CONTROL**

- A. Where fill materials are specified by reference to a specific standard, testing of samples for compliance will be provided before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.
- C. Notify utility company to remove and relocate utilities, where and as required.

### **3.02 TRENCHING**

- A. Excavate trenches as required to allow project pipe to be installed to line and grade as indicated on the drawings.
- B. Notify City Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. It is recommended that all trenching be done according to OSHA Standards and other applicable regulations.
- D. Do not interfere with 45 degree bearing splay of adjacent foundations.
- E. Excavate trenches to width, depth and cross section as indicated on the trench detail drawings.
- F. Hand trim excavations. Remove loose matter.
- G. Remove large stones and other hard matter which could damage piping or impede consistent backfilling or compaction.
- H. Remove excavated material that is unsuitable for re-use on the project from site and dispose of in an acceptable manner.
- I. Stockpile excavated material to be re-used in area designated on site.
- J. Remove excess excavated material from site and dispose of in an acceptable manner.
- K. Excavation beyond or below lines and grades indicated shall be refilled with fill material and compacted, at the Contractor's expense.
- L. During construction, provide and maintain sufficient means and devices to promptly remove and properly dispose of all water entering excavations or other parts of the work.
  - 1. Dispose of water from work area in an acceptable manner, without damage to adjacent property.



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2. No pipe, concrete footings, foundations, or floors shall be installed in water.
  3. Water shall not be allowed to rise over concrete until it has set for at least 24 hours.
  4. Water shall not be allowed to rise against walls and supporting beams for a period of 14 days after completion of walls and beams.
  5. Any damage to pipe work or concrete work caused by water shall be repaired by the Contractor, at his expense.
- M. The use of explosives will not be allowed; unless use has been specifically reviewed and accepted by the City Engineer. All blasting shall be done by a reputable contractor specializing in the use of explosives, and is acceptable to the City Engineer.
1. Comply with all laws, ordinances, and applicable safety code requirements and regulations relative to the handling, storage, and use of explosives and protection of life and property.
  2. Contractor shall be fully responsible for all damage attributable to his blasting operations.
  3. Excessive blasting or over shooting will not be permitted.
  4. Remove any material outside of authorized cross-section which may be shattered or loosened by blasting operation.

### **3.03 PREPARATION FOR PIPE LINE PLACEMENT**

- A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with bedding material, Fill Type III, or stabilization material, Fill Type V, or other acceptable material, as directed by the Engineer.
- B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

### **3.04 BACKFILLING**

- A. Backfilling shall conform to the requirements of Section 02316S - Fill and Backfill.
- B. Backfill pipe zone with bedding material, Fill Type III, or other acceptable material.
- C. Backfill above pipe zone, up to subgrade or finish grade elevations, as indicated on the

trench detail drawings.

- D. Employ a placement method that does not disturb or damage project pipe or other work.
- E. Do not backfill with wet or frozen materials.
- F. Maintain optimum moisture content of fill materials to attain required compaction density.
- G. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- H. Soil Fill: Place and compact material in equal continuous layers not exceeding 12 inches compacted depth.
- I. Where directed by the City Engineer, backfill material may be consolidated by an acceptable method.
- J. Correct areas that are over-excavated.
  - 1. Thrust bearing surfaces: Fill with concrete.
  - 2. Use structural fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
- K. Compaction Density Unless Otherwise Specified or Indicated:
  - 1. Under paving, concrete work, and similar construction: 97 percent of maximum dry density.
  - 2. Within street rights-of-way: 97 percent of maximum dry density.
  - 3. At other locations: 95 percent of maximum dry density.
- L. Reshape and re-compact fills subjected to vehicular traffic.

### **3.05 BEDDING AND FILL AT SPECIFIC LOCATIONS**

- A. Project Pipe Lines:
  - 1. Pipe Bedding: Use granular fill, Fill Type III.
  - 2. Backfill trench to subgrade or finish elevations with structural fill, Fill Type II.
  - 3. Compact bedding material in maximum 6 inch lifts to 97 percent of maximum dry density.
  - 4. Compact backfill material in maximum 12 inch lifts to 97 percent of maximum dry density.

### **3.06 TOLERANCES**

- A. Top Surface of Backfilling in unimproved areas: Plus or minus 1 inch from required

elevations.

- B. Top Surface of Backfilling in improved areas: Plus or minus 1/2 inch from required elevations.

### **3.07 FIELD QUALITY CONTROL**

- A. Testing is to be done as indicated in the Supplemental General Conditions; test results will be sent to the Engineer within 24 hours after the tests are completed.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests: one test for each 200 c.y. of material, or as directed by the Engineer.

### **3.08 CLEAN-UP**

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

**END OF SECTION**

September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02315S**

**STRUCTURAL EXCAVATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Excavating for structure volume below grade, footings, slabs-on-grade, paving, curb and gutter, sidewalks and other concrete work.

**1.02 RELATED SECTIONS**

- A. Section 02312S - Trenching for Pipe Work: Excavating, backfilling and compacting for project pipe lines and electrical service lines.
- B. Section 02316S - Fill and Backfill: Fill materials, filling, and compacting.

**1.03 MEASUREMENT AND PAYMENT**

- A. See Section 02100 - Measurement and Payment.

**1.04 PROJECT CONDITIONS**

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.

### **3.02 EXCAVATING**

- A. Excavate to accommodate new structures and construction operations to lines and elevations indicated.
- B. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. It is recommended that all excavating be done according the OSHA Standards and other applicable safety regulations.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Cut excavations wide enough to allow construction of structures as indicated; bottom dimensions shall be sufficient to provide at least 12 inches clear between extreme outside of concrete work and side of excavation. No tunneling or under cutting will be permitted.
- F. Hand trim excavations. Remove loose matter.
- G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 02316S.
- H. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- I. Remove excavated material that is unsuitable for re-use from site and dispose of in an acceptable manner.
- J. Stockpile excavated material to be re-used in areas designated on site..
- K. Remove excess excavated material from site and dispose of in an acceptable manner.

### **3.03 BACKFILLING**

- A. Backfilling shall conform to the requirements of Section 02316S - Fill and Backfill.
- B. Backfill under structures with structural backfill material, Fill Type II, or other acceptable material, and compact to 97 percent of maximum density.
- C. Backfill around structures with structural backfill material, Fill Type II, or other acceptable material, up to subgrade or finish grade elevations, as indicated, and compact to 97 percent of maximum density.
- D. Employ placement method that will not disturb or damage structure.
- E. Backfill shall be brought up uniformly around structures, so as to eliminate any possibility of unbalanced loading on structure which could damage or movement.
- F. No backfill shall be placed against new concrete work until concrete has been accepted by the Engineer; and backfill operation has been authorized.
- G. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted.
- H. Structural Backfill: Place and compact materials uniformly around structures in equal continuous layers not exceeding 12 inches compacted.
- I. Correct areas that are over-excavated with structural backfill material, compacted to minimum 97 percent of maximum dry density; at the Contractor's expense.

### **3.04 FIELD QUALITY CONTROL**

- A. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.
- B. Testing is to be done as indicated in Supplemental General Conditions; test results will be sent to the Engineer within 24 hours after the tests are completed.
- C. Perform compaction density testing on compacted backfill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.

### **3.05 PROTECTION**

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

### **3.06 CLEAN-UP**

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02316S**

**FILL AND BACKFILL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Backfilling and compacting for project pipe lines.
- B. Backfilling and compacting for project electrical service lines.
- C. Filling, backfilling, and compacting for building and miscellaneous structures.

**1.02 RELATED SECTIONS**

- A. Section 02312S - Trenching for Pipe Work: Excavating for project pipe lines.
- B. Section 02315 - Structural Excavation: Excavating for structures.

**1.03 MEASUREMENT AND PAYMENT**

- A. See Section 02100 - Measurement and Payment.
- B. Field measurements, of trenches and other excavations, and weigh tickets will be used as a check of measurement for materials furnished, but will not be individually considered as evidence of placement.
  - 1. A factor based on the density of material used will be used for converting from tons to cubic yards measurements when tickets are used for checking quantities furnished. Allowance for waste will be considered in such conversions.

**1.04 REFERENCES**

- A. AASHTO T 99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and an 12-in. (305 mm) Drop; 1992 (Interim).
- B. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils



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Using a 10-lb (4.54 kg) Rammer and an 18-in.(457 mm) Drop; American Association of State Highway and Transportation Officials; 1992 (Interim).

- C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 1996a.
- D. ASTM D 698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)); 1991.
- E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 1990 (Reapproved 1996).
- F. ASTM D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN m/m<sup>3</sup>)); 1991.
- G. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994.
- H. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- I. ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System); 1993.
- J. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 1996.
- K. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 1996.
- L. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 1995a.

### 1.05 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings.
- B. Subgrade Elevations: Indicated on drawings.
- C. Pipe Invert Elevations: Indicated on drawings.

### 1.06 SUBMITTALS

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing

laboratory, if requested by the Engineer.

- C. Materials Sources: Submit name of imported materials source.
- D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, if requested by the Engineer.
- E. Compaction Density Test Reports.

## **1.07 PROJECT CONDITIONS**

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where designated.
  - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
  - 2. Prevent contamination.
  - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the Work are as indicated.

## **PART 2 PRODUCTS**

### **2.01 FILL MATERIALS**

- A. General Fill - Fill Type I: Imported borrow or soil excavated on-site if acceptable to the Engineer; conforming to Type A-2 of AASHTO Classification of Soils and Soil-Aggregate Mixtures.
  - 1. Graded.
  - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
  - 3. Conforming to ASTM D 2487 Group Symbol CL; liquid level less than 50.
- B. Structural Fill - Fill Type II: Imported borrow or soil excavated on-site if acceptable to the Engineer; conforming to Type A-1 or A-2 of AASHTO Classification of Soils and Soil-Aggregate Mixtures.
  - 1. Graded.
  - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, deleterious matter and debris.
  - 3. Conforming to ASTM D 2487 Group Symbol GW, GP, SW and SP.
  - 4. Not more than 15% passing No. 200 sieve.
- C. Concrete for Fill: Lean concrete.

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1. Conforming to Flowable Fill, Section 845 of the Utah Department of Transportation's Standard Specifications.
- D. Granular Fill - Gravel - Fill Type III: Angular crushed washed stone; free of shale, clay, friable material and debris.
  1. Graded in accordance with ASTM C 136, within the following limits:
    - a. 2 inch sieve: 100 percent passing.
    - b. 1 inch sieve: 95 percent passing.
    - c. 3/4 inch sieve: 95 to 100 percent passing.
    - d. 5/8 inch sieve: 75 to 100 percent passing.
    - e. 3/8 inch sieve: 55 to 85 percent passing.
    - f. No. 4 sieve: 35 to 60 percent passing.
    - g. No. 16 sieve: 15 to 35 percent passing.
    - h. No. 40: 10 to 25 percent passing.
    - i. No. 200: 5 to 10 percent passing.
- E. Granular Fill - Pea Gravel - Fill Type IV: Natural stone; washed, free of clay, shale, organic matter.
  1. Graded in accordance with ASTM C 136, within the following limits:
    - a. Minimum Size: 1/4 inch.
    - b. Maximum Size: 5/8 inch.
- F. Granular Fill - Course Gravel - Fill Type V: Free draining granular backfill material; natural or crushed aggregate.
  1. Graded in accordance with ASTM C-136, within the following limits:
    - a. 2 inch sieve: 100 percent passing.
    - b. 1 inch sieve: 95 to 100 percent passing.
    - c. 1/2 inch sieve: 25 to 60 percent passing.
    - d. No. 4 sieve: 0 to 10 percent passing.
- G. Sand - Fill Type VI: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.
  1. Graded in accordance with ASTM C 136; within the following limits:
    - a. No. 4 sieve: 100 percent passing.
    - b. No. 14 sieve: 10 to 100 percent passing.
    - c. No. 50 sieve: 5 to 90 percent passing.
    - d. No. 100 sieve: 4 to 30 percent passing.
    - e. No. 200 sieve: 0 percent passing.
- H. Topsoil - Fill Type VII: Topsoil excavated on-site.
  1. Graded.
  2. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
  3. Acidity range (pH) of 5.5 to 7.5.
  4. Containing a minimum of 4 percent and a maximum of 25 percent inorganic matter.
  5. Conforming to ASTM D2487 Group Symbol OH.

## **2.02 SOURCE QUALITY CONTROL**

- A. Where fill materials are specified by reference to a specific standard, testing of samples for compliance will be provided before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Identify required lines, levels, contours, and datum locations.
- B. Verify structural ability of unsupported walls to support imposed loads by the fill.

### **3.02 PREPARATION**

- A. Scarify subgrade surface to a depth of to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Fill Type II or III.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

### **3.03 FILLING**

- A. Fill to finish contours and elevations indicated using unfrozen materials.
- B. Fill up to subgrade elevations where indicated.
- C. Employ a placement method that does not disturb or damage other work.
- D. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.

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- F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- G. Soil Fill: Place and compact material in equal continuous layers not exceeding 12 inches compacted depth.
- H. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend project slopes into existing areas.
- I. Correct areas that are over-excavated.
  - 1. Load-bearing foundation surfaces: Fill with concrete for water line thrust blocks.
  - 2. Load-bearing foundation surfaces: Use structural fill, Fill Type II, flush to required elevation, compacted to 97 percent of maximum dry density.
  - 3. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
- J. Compaction Density Unless Otherwise Specified or Indicated:
  - 1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.
  - 2. Under structures: 97 percent of maximum dry density.
  - 3. At other locations: 95 percent of maximum dry density.
- K. Consolidation density shall be 85 percent of maximum dry density.
- L. Reshape and re-compact fills subjected to vehicular traffic.

### 3.04 FILL AT SPECIFIC LOCATIONS

- A. Fill in unimproved areas:
  - 1. Use general fill, Fill Type I, unless otherwise specified or indicated.
  - 2. Fill to finish grade elevations
  - 3. Maximum depth per lift: 12 inches, compacted.
  - 4. Consolidate to minimum 85 percent of maximum dry density.
- B. Structural Fill at structures and embankments:
  - 1. Use structural fill, Fill Type II.
  - 2. Fill up to subgrade elevations.
  - 3. Maximum depth per lift: 12 inches, compacted.
  - 4. Compact to minimum 97 percent of maximum dry density.
- C. Under curb and gutter, sidewalks, slabs-on-grade, and other concrete work:
  - 1. Use granular fill, Fill Type II or III.
  - 2. Depth: six inches deep, or as indicated on drawings.
  - 3. Compact to 97 percent of maximum dry density.
- D. At Foundation Walls and Footings:

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1. Use structural fill, Fill Type II.
  2. Fill up to finish grade elevation.
  3. Compact each lift to 97 percent of maximum dry density.
  4. Do not backfill against unsupported foundation walls.
  5. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- E. At Landscaped and Cultivated Areas:
1. Use general fill, Fill Type I.
  2. Fill up to 24 to 36 inches below finish grade elevations.
  3. Compact to 95 percent of maximum dry density.

### 3.05 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

### 3.06 FIELD QUALITY CONTROL

- A. Testing is to be done by an independent testing company for the Owner or Contractor, as indicated in the Supplemental General Conditions; test results for all tests will be sent to the Engineer within 24 hours after the tests have been completed.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests: as directed by the Engineer.

### 3.07 CLEAN-UP

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02324S**

**COMPACTION**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Compaction of fill material for embankment foundations, areas through cuts, embankments, dikes, backfill, and other materials.

**1.2 REFERENCES**

- A. AASHTO T 99: Moisture-Density Relations of Soils Using a 2.5 kg (5.5 lb.) Rammer and a 305 mm (12 in.) Drop. (Method D)
- B. AASHTO T 180: Moisture-Density Relations of Soils Using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop. (Method D)
- C. AASHTO T 310: In-place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

**1.3 ACCEPTANCE TESTING (BY DEPARTMENT)**

- A. Density Requirement: The Engineer accepts a test lot following the standard for average density - not less than 96 percent of maximum laboratory density, and when no single determination is lower than 92 percent of maximum laboratory density.
- B. Test Lot for Embankment and Subgrade:
  - 1. Number of tons or cubic yards of embankment placed and compacted during each production day.
  - 2. Divide test lots into sublots of approximately 3000 tons or 2000 yd<sup>3</sup> and 6000 yd<sup>2</sup> in cut sections, and take one random density test within each subplot.
- C. Test Lot for Backfill:
  - 1. Engineer accepts backfill at pipe culverts, small structures, concrete box

- culverts, and bridges based on acceptance of the average of four density determinations in a test area.
- 2. A test lot will not exceed 200 yd<sup>3</sup> of material or be more than one pipe culvert or small structure.
- D. Test Lot for Embankment for Bridge:
  - 1. Take at least six random density tests at both ends of the bridge in each 12 inch layer.
    - a. Conform to AASHTO T 180, Method D.
    - b. Randomly select four of the tests.
    - c. Select two of the test within 2.0 feet of the outside perimeter of each layer.
  - 2. Engineer takes density tests:
    - a. In the backfill material replacing sub-excavated areas.
    - b. In the lower layers of required surcharge as shown.

**PART 2 PRODUCTS Not used.**

**PART 3 EXECUTION**

**3.1 COMPACTION**

- A. Moisten or de-water backfill material to obtain optimum moisture for compaction operations.
- B. Use a hand-operated vibratory compactor or a vibratory roller adjacent to backwalls of structure abutments and approach slabs.
- C. Conform to:
  - 1. AASHTO T 180, Method D for A-1 soils.
  - 2. AASHTO T 99, Method D for all other soils.
  - 3. AASHTO T 310 for in-place field density.

**END OF SECTION**



**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02373S**

**LANDSCAPING COBBLE ROCK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

A. Rock properties for landscaping cobble rock.

Rock used for landscaping cobble rock should be hard, durable, circular in shape, and free from cracks, overburden, shale and organic matter. Neither breadth nor thickness of a single stone should be greater than 1/3 the length. The rock should sustain a loss of not more than 40 percent after 500 revolutions in an abrasion test (Los Angeles machine – ASTM C-535) and should sustain a loss of not more than 10 percent after 12 cycles of freezing and thawing (AASHTO test 102 for ledge rock, procedure A). Rock having a minimum specific gravity of 2.65 is preferred, however, in no case should rock have a specific gravity less than 2.50. In lieu of testing requirements, rock obtained from Engineer approved quarries may be used.

B. Color Requirements

The color of the landscape cobble rock shall be as required in the contract plans and approved by the engineer. The majority (95%) and greater of the landscaping cobble rock shall be of the same color family. Approval for variation in color shall be made by the engineer

C. Bedding Requirements

Long term stability of landscaping cobble rock and cobble rock erosion protection is strongly influenced by proper bedding conditions. A large percentage of all cobble rock failures is directly attributable to bedding failures. A properly design bedding provides a buffer of intermediate sized material between the landscape area and the channel bed and the landscaping cobble rock to prevent piping of particles through the voids in the landscaping cobble rock.

The requirements for bedding thickness per the type of soil are presented in Table 1 below.

Table 1.

Thickness Requirements for Granular Bedding  
Minimum Bedding Thickness

TYPE OF SOIL	FINE SOILS	MEDIUM SOILS	COURSE SOILS
LANDSCAPING COBBLE ROCK SIZE IN INCHES	TYPE I (IN)	TYPE II (IN)	TYPE II (IN)
2" to 4"	6	6	4
4" to 6"	6	6	4
6" to 8"	6	4	4
8" to 10"	6	4	4

NOTES:

1. Fined grained soils require a two layer filter with fabric.
2. For course or medium grained soils the filter requirements may be substituted with a single 4" or 6" layer Type II bedding and a filter fabric.
3. Fabric shall not be placed on slopes greater than 2.5:1 where landscaping cobble rock is to be placed.
4. A coarse grained soil is defined as having 50% or more by weight retained on the #40 sieve.

Rock filler for the wire baskets should meet the rock property requirements for ordinary landscaping cobble rock. The maximum stone size should not exceed 2/3 the basket depth or 12 inches, whichever is smaller.

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02620S**

**GEOTEXTILE FABRIC / LAND DRAINAGE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

Fabric Material.

Construction – Trench Installation Requirements.

**1.02 RELATED SECTIONS**

- A. Section 02312S – Trenching For Pipe Work
- B. Section 02316S – Fill And Backfill
- C. Section 02635S – Storm Drain System
- D. Section 02640S - Manhole And Cover

**1.03 UNIT PRICES**

- A. Method of Measurement: Per Section 02100S – Measurement And Payment (by the linear foot of trench installation or square yard – or as indicated in contract documents including seams, overlaps, and wastage).
- B. Method of Measurement: Per Section 02100S - Measurement And Payment.

**1.04 REFERENCES**

- A. AASHTO Standards:
  - 1. T88 - Particle Size Analysis of Soils
  - 2. T90 - Determining the Plastic Limit and Plasticity Index of Soils
  - 3. T99 - The Moisture-Density Relations of Soils Using a 5.5lb (2.5 kg) Rammer and a 12in (305 mm) Drop.
  - 4. M288-96 - Geotextile Specification for Highway Applications

- B. American Society for Testing and Materials (ASTM):
  - 1. D 123 - Standard Terminology Relating to Textiles
  - 2. D 276 - Test Method for Identification of Fibers in Textiles
  - 3. D 3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics
  - 4. D 4354 - Practice for Sampling of Geosynthetics for Testing
  - 5. D 4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
  - 6. D 4439 - Terminology for Geotextiles
  - 7. D 4491 - Test Methods for Water Permeability of Geotextiles by Permittivity
  - 8. D 4533 - Test Method for Index Trapezoid Tearing Strength of Geotextiles
  - 9. D 4595 - Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
  - 10. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles
  - 11. D 4751 - Test Method for Determining Apparent Opening Size of a Geotextile
  - 12. D 4759 - Practice for Determining the Specification Conformance of Geosynthetics
  - 13. D 4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
  - 14. D 4873 - Guide for Identification, Storage, and Handling of Geotextiles
  - 15. D 5141 - Test Method to Determine Filtering Efficiency and Flow Rate for Silt Fence Applications Using Site Specific Soils
- C. Texas Department of Transportation, Manual of Testing Procedures
  - 1. TEX 616-J - Asphalt Retention and Potential Change of Area
- D. Federal Highway Administration (FHWA) - Geosynthetic Design and Construction Guidelines, Publication No. FHWA HI-95-038, May 1995.
- E. American Association for Laboratory Accreditation (A2LA)
- F. Geosynthetic Accreditation Institute (GAI) - Laboratory Accreditation Program (LAP).
- G. National Transportation Product Evaluation Program (NTPEP)

## **1.05 DEFINITIONS**

Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

Geotextile to allow for long-term passage of water into a subsurface drain system retaining the in-situ soil. The primary function of the geotextile is filtration.

## **1.06 SUBMITTALS**

- A. Submit the following :
  - 1. Certification: The contractor shall provide to the Engineer a certificate stating the name of the manufacturer, product name, style number, chemical composition of the filaments or yarns and other pertinent information to fully describe the geotextile. The Certification shall state that the furnished geotextile meets MARV requirements of the specification as evaluated under the Manufacturer's quality control program. The Certification shall be attested to by a person having legal authority to bind the Manufacturer.

## **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  - 1. Geosynthetic Accreditation Institute (GAI)- Laboratory Accreditation Program (LAP)
  - 2. American Association for Laboratory Accreditation (A2LA)

## **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Geotextiles labeling, shipment, and storage shall follow ASTM D 4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.
- B. Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.
- C. During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: site construction damage, precipitation, extended ultraviolet radiation including sunlight, chemicals that are strong acids or strong bases, flames including welding sparks, excess temperatures, and any other environmental conditions that may damage the physical property values of the geotextile.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Geotextile:
  - 1. The geotextile shall be manufactured with fibers consisting of long-chain synthetic polymers composed of at least 95 percent by weight of

polyolefins or polyesters. They shall form a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.

2. Woven slit film geotextiles (i.e., geotextiles made from yarns of a flat, tape-like character) shall not be allowed.
3. The geotextile shall meet the requirements of Table 1. All numeric values in Table 1 except AOS represent MARV in the weakest principal direction. Values for AOS represent maximum average roll values.

**TABLE 1 - SUBSURFACE DRAINAGE GEOTEXTILE**

Property	Test Method	Units	Elongation < 50% <sup>1</sup>	Elongation > 50% <sup>1</sup>
Grab Tensile Strength	ASTM D 4632	N (lbs)	1100 (247)	700 (157)
Sewn Seam Strength <sup>2</sup>	ASTM D 4632	N (lbs)	990 (222)	630 (142)
Tear Strength <sup>3</sup>	ASTM D 4533	N (lbs)	400 (90)	250 (56)
Puncture Strength	ASTM D 4833	N (lbs)	400 (90)	250 (56)
Burst Strength	ASTM D 3786	kPa (psi)	2700 (391)	1300 (188)
Permittivity	ASTM D 4991	sec <sup>-1</sup>	0.1	0.1
Apparent Opening Size	ASTM D 4751	mm (U.S. Sieve)	0.22 max (70)	0.22 max (70)
Ultraviolet Stability <sup>4</sup>	ASTM D 4355	%	50	50

<sup>1</sup> A measured in accordance with ASTM D 4632

<sup>2</sup> When sewn seams are required.

<sup>3</sup> The required MARV Tear Strength for woven monofilament geotextiles is 250 N(56lbs)

<sup>4</sup> After 500 hrs

4. Approved geotextiles are as follows:  
Elongation <50 %: Mirafi 160N

## 2.02 QUALITY CONTROL

- A. Manufacturing Quality Control: Testing shall be performed at a laboratory accredited by GAI-LAP and A2LA for tests required for the geotextile, at frequency meeting or exceeding ASTM D 4354.
- B. Geotextile properties, other than Sewn Seam Strength, Burst Strength, and Ultraviolet Stability shall be tested by NTPEP to verify conformance with this specification.

- C. Sewn Seam Strength shall be verified based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality assurance samples obtained using Procedure B of ASTM D 4354. A lot size for conformance or quality assurance sampling shall be considered to be the shipment quantity of the given product or a truckload of the given product, whichever is smaller.
- D. Ultraviolet Stability shall be verified by an independent laboratory on the geotextile or a geotextile of similar construction and yarn type.

## **PART 3        EXECUTION**

### **3.01    PREPARATION**

- A. Trench excavation shall be done in accordance with details of the project plans. In all instances excavation shall be done in such a way so as to prevent large voids from occurring in the sides and bottom of the trench. The graded surface shall be smooth and free of debris.

### **3.02    INSTALLATION**

- A. The geotextile shall be placed loosely with no wrinkles or folds, and with no void spaces between the geotextile and the ground surface. Successive sheets of geotextiles shall be overlapped a minimum of 300 mm (12 in), with the upstream sheet overlapping the downstream sheet.
- B. In trenches equal to or greater than 300 mm (12 in) in width, after placing the drainage aggregate the geotextile shall be folded over the top of the backfill material in a manner to produce a minimum overlap of 300 mm (12 in). In trenches less than 300 mm (12 in) but greater than 100 mm (4 in) wide, the overlap shall be equal to the width of the trench. Where the trench is less than 100 mm (4 in) the geotextile overlap shall be sewn or otherwise bonded. All seams shall be subject to the approval of the Engineer.
- C. Should the geotextile be damaged during installation or drainage aggregate placement, a geotextile patch shall be placed over the damaged area extending beyond the damaged area a distance of 300 mm (12 in), or the specified seam overlap, whichever is greater.
- D. Placement of drainage aggregate should proceed immediately following placement of the geotextile. The geotextile should be covered with a minimum of 300 mm (12 in) of loosely placed aggregate prior to compaction. If a perforated collector pipe is to be installed in the trench, a bedding layer of drainage aggregate should be placed below the pipe, with the remainder of the aggregate placed to the minimum required construction depth.

- E. The aggregate should be compacted with vibratory equipment to a minimum of 95 percent Standard AASHTO density unless the trench is required for structural support.

**END OF SECTION**



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**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02635S**

**STORM DRAIN SYSTEM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Storm drain pipe, fittings, and accessories.
- B. Connection of project storm drain pipe line to existing storm drains.
- C. Cleanout boxes, gutter inlet boxes, inlet boxes, diversion boxes, and appurtenant items.

**1.02 RELATED SECTIONS**

- A. Section 02312S - Trenching for Pipe Work: Excavating, bedding, backfilling and compacting.
- B. Section 02315S- Excavation: Excavating for structures and appurtenant items.
- C. Section 02316S- Fill and Backfill: Bedding and backfilling.
- D. Section 02640S- Manholes and Covers.
- E. Section 03300S- Cast-in-Place Concrete: Concrete for miscellaneous construction.

**1.03 REFERENCES**

- A. ASTM C 14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe; 1995.
- B. ASTM C 76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 1997.
- C. ASTM C 443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets; 1994.

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- D. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications; 1989 (Reapproved 1995).
- E. ASTM D 3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 1997.
- F. ASTM F 477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 1993.
- G. ASTM F 679 - Standard Specification for PolyVinyl Chloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings; 1989.
- H. ASTM F 794 - Standard Specification for PolyVinyl Chloride (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter; 1993.

### **1.04 DEFINITIONS**

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

### **1.05 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating pipe, pipe accessories, and miscellaneous structures.
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Project Record Documents:
  - 1. Record location of pipe lines, connections, cleanouts, gutter inlet boxes, inlet boxes, and miscellaneous structures and invert elevations.
  - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

### **1.06 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for materials and installation of the Work of this section.

### **1.07 PROJECT CONDITIONS**

- A. Coordinate the Work with other contractor working in the area.

## **PART 2 PRODUCTS**

### **2.01 DRAIN PIPE MATERIALS**

- A. Concrete Pipe: Nonreinforced, ASTM C 14 (ASTM C 14M), Class 3 minimum; inside nominal diameter as indicated, bell and spigot end joints.
- B. Concrete Pipe: Reinforced, ASTM C 76 (ASTM C 76M), Class III minimum with Wall type B; mesh reinforcement; inside nominal diameter as indicated, bell and spigot end joints.
- C. Reinforced Concrete Pipe Joint Device: ASTM C 443 (ASTM C 443M), rubber compression gasket joint.
- D. PVC Sewer Pipe: ASTM D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) pipe, SDR35, with PVC plastic material having cell classification of 12454B or 12454C; inside nominal diameter 4 inches thru 15 inches; bell and spigot end joint and Elastomeric gasket.
- E. PVC Sewer Pipe: ASTM D 679, Poly(Vinyl Chloride) (PVC) pipe, T-1 wall thickness, with PVC plastic material having cell classification of 12454B or 12454C; inside nominal diameter 18 inches thru 24 inches; bell and spigot end joint and elastomeric gasket.
- F. Ribbed PVC Sewer Pipe: ASTM F 794, PolyVinyl Chloride (PVC) Ribbed Sewer Pipe with smooth interior wall; Series 46 wall thickness; PVC plastic material having cell classification of 12454B or 12454C; inside nominal diameter of 24-inches thru 30 inches; bell and spigot end joint with elastomeric gasket.

### **2.02 PIPE ACCESSORIES**

- A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

### **2.03 STORM DRAIN STRUCTURES**

- A. Frames and Covers: Heavy duty cast iron, as indicated or acceptable equal; designed for H-20 highway loading.
  - 1. Gutter Inlet Box:
    - a. Lid Design: bicycle proof design grate; size and type as indicated.
  - 2. Cleanout box:
    - a. Lid Design: solid, with pick holes; size and type as indicated.

3. Inlet Box:
  - a. Lid Design: bicycle proof design grate; size and type as indicated.
- B. Precast Box: type and size as indicated; minimum wall thickness of 6-inches, minimum top and bottom slab thickness of 8-inches; design for H-20 highway loading; sleeved to receive storm drain pipe sections. Concrete work shall conform to Section 03300S.
- C. Cast-in-Place Box: of type and size indicated; concrete work shall conform to Section 03300S; sleeved to receive storm drain pipe sections.
- D. Joint Filler: flexible, bituminous mastic, gasket type sealant.

## **2.04 BEDDING AND BACKFILL MATERIALS**

- A. Bedding: As specified in Sections 02312S and 02316S.
- B. Backfill: As specified in Sections 02312S and 02316S.

## **PART 3 EXECUTION**

### **3.01 TRENCHING**

- A. See Section 02312S, Trenching for Pipe Work, and Sections 02315S and 02316S for additional requirements.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Backfill around pipe with bedding material as indicated, tamp in place and compact; then complete backfilling.

### **3.02 INSTALLATION - PIPE**

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.
- B. Install concrete pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
- C. Install PVC pipe, fittings, and accessories in accordance with ASTM D 2321 and manufacturer's instructions. Seal joints watertight.
- D. Install pipe to slope gradients noted on drawings; with maximum variation from true slope of 0.10 feet.

- E. Connect to existing storm drain boxes as indicated.
- F. Install continuous trace wire 6 inches above top of pipe; coordinate with Section 02316S.

### **3.03 INSTALLATION - STORM DRAIN STRUCTURES**

- A. Trim bottom of excavation clean and smooth to correct elevation; place bedding as indicated.
- B. Install precast boxes plumb, according to the manufacturer's instructions, at the design elevations as indicated; connect project pipes with appropriate type flexible couplings.
- C. Construct cast-in-place concrete boxes, as indicated; connect project pipes with appropriate type flexible couplings.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated.
- E. Install lid and frame level in top slab of box, as indicated, according to manufacturer's instructions.
- F. Fill all joints between box sections, grade rings, and cover frames with joint sealant.

### **3.04 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance to specifications.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
- C. Low Pressure Air Test: Pressurize line to be tested to approximately 3.5 psi. Allow pressure to stabilize for a minimum of 2 minutes; if during this period pressure drops below 3.5 psi, more air shall be added to raise pressure up to 3.5 psi. After this stabilization period, air supply shall be disconnected and timing shall begin. The time of the test, in minutes, shall be equal to the pipe diameter, in inches. The maximum allowable pressure drop during the specified time period shall be 1.0 psi.
- D. Infiltration Test: Infiltration test required when pipe line is below groundwater level. The amount of water leaking into the pipe shall be measured; allowable infiltration shall be 10 gallons per day per inch diameter of pipe per mile of pipe.
- E. Exfiltration Test: Exfiltration test required when pipe line is above groundwater level. The section of pipe to be tested, including upstream structure, shall be filled with water to not less than four feet nor more than eight feet above lowest point of pipe section being tested. The amount of water added during the test period to maintain water level shall be

measured; allowable exfiltration shall be 10 gallons per day per inch diameter of pipe per mile of pipe.

Deflection Test: Check alignment by sighting through pipe or by measurements. Pipe lines shall not vary from alignment shown on the drawings by more than 0.25 foot.

Televise Storm Drain Lines: After pipe lines have been tested for leakage and alignment, the storm drain lines shall be televised, along with appropriate narrative, by a company specializing in this type of work. A copy of the videotape shall be provided to the Engineer. (Videotape required for all pipe size diameters smaller than 42". All pipe 42" in diameter and/or larger shall be visually inspected by the project inspector/engineer and/or client.)

### **3.05 PROTECTION**

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

**END OF SECTION**

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**SPECIAL PROVISIONS**

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**SECTION 02640S**

**MANHOLES AND COVERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Monolithic cast-in-place concrete manholes with masonry or precast transition to lid frame, covers, anchorage, and accessories.
- B. Modular precast concrete manhole sections with tongue-and-groove joints, masonry or precast transition to lid frame, covers, anchorage, and accessories.

**1.02 RELATED SECTIONS**

- A. Section 03300S - Cast-In-Place Concrete.

**1.03 REFERENCES**

- A. ASTM A 48 - Standard Specification for Gray Iron Castings.
- B. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
- C. ASTM C 923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
- D. Use latest issue of the above reference standards as of the date of the project.

**1.04 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of pipe inverts.
- C. Product Data: Provide manhole covers, component construction, manhole steps,

features, configuration, and dimensions.

## **1.05 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with at least three years of documented experience.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Amcor-White, Inc.
- B. Geneva Pipe Company
- C. Substitutions: See Section 01600S - Product Requirements.

### **2.02 MATERIALS**

- A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C 478 (ASTM C 478M), with gaskets in accordance with ASTM C 923 (ASTM C 923M).
- B. Concrete: As specified in Section 03300S.
- C. Concrete Reinforcement: As specified in Section 03300S.

### **2.03 COMPONENTS**

- A. Manhole Base: precast concrete manhole base of appropriate size.
  - 1. Provide appropriate size flexible sleeves of synthetic rubber, with stainless steel clamps and bolts, for all pipe openings in base section.
  - 2. Construct poured-in-place manhole base where manhole is to be constructed over existing sewer pipe line, as directed by the City Engineer. Manhole base shall be constructed as indicated on the drawings.
- B. Manhole Rise Sections: precast riser sections of appropriate size and length, extending from top of base section to bottom of top section.
- C. Manhole Top Section: precast eccentric cone section of appropriate size, with 30-inch diameter top opening.
  - 1. Flat slab top sections can be used only where indicated on the plan drawings and accepted by the City Engineer; designed for H-20 live loading and one-foot minimum earth cover.



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- D. Joints: Base section, riser sections, and top section shall have lipped male/female ends, which shall provide uniform and continuous interior wall surface.
  - 1. Joints shall be sealed with pre-lubricated rubber gaskets, conforming to requirements of ASTM C 443 and C 361; Forsheda No. 114 Seal, manufactured by Forsheda Pipe Seal Company, or equal.
- E. Grade Rings: precast grade rings, as required, to adjust height of manhole lid and frame.
  - 1. Grade rings shall have key locks and use flexible, bituminous mastic, gasket-type sealer to insure watertight installation.
  - 2. Maximum height of grade rings shall be 12 inches.
- F. Lid and Frame: ASTM A 48, Class 30B Cast iron construction, machined flat bearing surface, removable lid with cleated surface and pick holes, lockable lid if indicated, vented lid design in improved areas and solid lid design in unimproved areas, H-20 highway load rating; lid molded with identifying name. Provide Model A-1180 manufactured by D & L Supply., or acceptable equal.
- G. Manhole Steps: Formed, copolymer polypropylene-encased, steel rungs; 3/4 inch diameter minimum. Cast-in-place or vibrate into green concrete. Model PSI-FF manhole steps, manufactured by M. A. Industries, Inc., or acceptable equal.
- H. Collars: constructed of concrete or bituminous as indicated on the drawings.

### 2.04 CONFIGURATION

- A. Manholes shall be constructed as indicated on the Standard Manhole Detail drawing.
- B. Shaft Construction: Concentric with eccentric cone top section; lipped male/female joints; sleeved to receive pipe sections.
- C. Shape: Cylindrical, unless indicated otherwise.
- D. Clear Inside Dimensions: 48 inch, 60 inch or 72 inch diameter, as indicated.
- E. Design Depth: As indicated.
- F. Clear Lid Opening: 30 inch diameter, as indicated.
- G. Pipe Entry: Provide openings for all pipes entering manhole, as indicated.
- H. Steps: 12 inches on center vertically, set into manhole wall directly under opening.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify items provided by other sections of Work are properly sized and located.
- B. Verify that built-in items are in proper location, and ready for roughing into Work.
- C. Verify excavation for manholes is correct.

### **3.02 PREPARATION**

- A. Where native material encountered at foundation depth of manhole is considered unsuitable, remove unsuitable material; and place and compact bedding material, to limits directed by City Engineer.

### **3.03 MANHOLES**

- A. Install precast concrete manhole base level on a compacted foundation, according to manufacturer's instructions.
- B. Construct cast-in-place manhole base over existing storm drain lines, as acceptable to the City Engineer. Manhole base shall be constructed as indicated on the drawing.
  - 1. After new manhole has been completed, saw-cut into top of existing storm drain pipe, remove section of pipe as required, and dispose of the removed material; construct watertight grout invert channels through new manhole, between new pipe and existing pipe line, as directed. Invert channel shall be formed to direct storm drain flows through the manhole as indicated.
  - 2. Divert existing storm drain flows around work area to allow connection to existing pipe line to be made.
- C. Place manhole riser sections plumb and level, from the manhole base to the top section, as indicated and according to manufacturer's instructions; anchor to base; align steps perpendicular to sewer line, and seal joints.
- D. Place top section, cone section or flat slab, on top riser section, with opening positioned over steps. Top of cone section or flat slab shall be from 10-inches to 18-inches below final surface elevation, as directed by the City Engineer.
- E. Install grade rings, as required, to adjust top of lid and frame to match finish elevation.
- F. Connect pipe to manhole with appropriate type flexible coupling as recommended by manufacturer. Provide pipe joint or flexible coupling on all pipes approximately 18-inches from outside of manhole. Grout around pipe after installation is complete; on

interior and exterior of manhole wall. Make connections watertight.

- G. Provide pipe stubs for future connections of the same type of pipe used on the project, and of the size indicated.
  - 1. Alignment and grade of stub to be determined by the Inspector or City Engineer.
  - 2. Install permanent, watertight plug or cap on end of stub, outside of the manhole.
- H. Grout inside of manhole base sections to form channel between connected pipes, as indicated. Trowel smooth. Top of channel shall be a same elevation as top of outlet pipe.
- I. Set cover frames and covers level without tipping, to correct elevations. After placement, grout around the exterior of frame from top of concrete top section to top of frame, as indicated, to ensure watertight condition.
- J. After manhole base has been completed, furnish and install temporary pipe plugs to seal all interior pipe openings; plugs to be Brent DuoSeal Pipe Plug by Burke Rubber Company, Cherne Pipe Plug by Cherne Manufacturing Company, or acceptable equal. Pipe plugs shall remain in place until final review and acceptance of completed storm drain. Plugs shall then be removed; and shall be property of Contractor.
- K. In paved areas, collars shall be constructed around covers as indicated. Collars shall be constructed after new pavement has been placed and accepted by the City Engineer.
- L. Coordinate with other sections of work to provide correct size, shape, and location.

### **3.04 FIELD QUALITY CONTROL**

- A. Manholes shall be tested using vacuum test method to demonstrate integrity of installed materials and construction procedures. Method and material for repair shall be as acceptable to the City Engineer.
  - 1. Each manhole shall be tested immediately after assembly and backfilling.
  - 2. Plug all lift holes, on interior and exterior of manhole, with an acceptable non-shrink grout.
  - 3. Plug all pipes entering manhole; securely brace plugs during test.
  - 4. Test head shall be placed at inside top of cast iron frame, or as accepted by City Engineer; and the seal shall be inflated in accordance with manufacturer's recommendations.
- B. Testing shall conform to ASTM C 1244, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.
- C. If manhole fails initial test, make necessary repairs with non-shrink grout. Manhole shall be retested until satisfactory test is obtained.

### **END OF SECTION**

September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02643S**

**SANITARY SEWER SYSTEM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Sanitary sewer piping, fittings and accessories.
- B. Casing pipes and accessories.
- C. Connection of project pipe to existing manholes.
- D. Sewer Service Connections.

**1.02 RELATED SECTIONS**

- A. Section 02312S - Trenching for Pipe Work: Excavating of trenches.
- B. Section 02316S - Fill and Backfill: Pipe bedding and trench backfilling.
- C. Section 02640S - Manholes and Covers.
- D. Section 03300S - Cast-In-Place Concrete: Concrete for manhole base construction.

**1.03 REFERENCES**

- A. ASTM C 14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
- B. ASTM C 76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- C. ASTM C 443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- D. ASTM D 2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

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- E. ASTM D 3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- F. ASTM F 477 - Standard Specification for Elastometric Seals (Gaskets) for Joining Plastic Pipe.
- G. ASTM F 679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Gravity Sewer Pipe and Fittings; 18-inch through 24-inch smooth solid wall sewer pipe.
- H. ASTM F 794 - Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter; 21 through 30-inch ribbed or close profile sewer pipe with smooth interior wall.
- I. ASTM F 949 - Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings; 24-inch through 36-inch sewer pipe.
- J. Use latest issue of the above reference standards as of the date of the project.

### **1.04 DEFINITIONS**

- A. Pipe Bedding: Fill placed within the pipe zone, which is under, beside and directly over pipe, prior to subsequent backfill operations; see standard trench detail drawing.

### **1.05 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating pipe, pipe accessories, and fittings.
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Project Record Documents:
  - 1. Record location of pipe lines, connections, manholes, sewer laterals, and invert elevations.
  - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

### **1.06 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for materials and installation of the Work of this section.

### **1.07 PROJECT CONDITIONS**

- A. Coordinate the Work on sewer lines and connections to existing manholes with City.

## **PART 2 PRODUCTS**

### **2.01 SEWER PIPE MATERIALS**

- A. Concrete Pipe: Nonreinforced, ASTM C 14 (ASTM C 14M), Class 3; inside nominal diameter of 8 inches through 15 inches, bell and spigot end joints.
- B. Concrete Pipe: Reinforced, ASTM C 76 (ASTM C 76M), Class III (minimum) with Wall type B; mesh reinforcement; inside nominal diameter of 18 inches and larger, bell and spigot end joints.
- C. Cement for concrete sewer pipe shall be Type V, sulfate resistant, conforming to ASTM C 150.
- D. Joint Seals for Concrete Pipe: ASTM C 443 (ASTM C 443M) rubber compression gaskets.
- E. Plastic Pipe: ASTM D 3034, Type PSM, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 4 inches through 15 inches, bell and spigot joint ends with gaskets.
- F. Plastic Pipe: ASTM F 679, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 18 inches through 24 inches, bell and spigot joint ends with gaskets.
- G. Plastic Pipe: ASTM F 794, Poly(Vinyl Chloride) (PVC) material, cell classification of 12454C or 12364A; ribbed or close profile pipe; inside nominal diameter of 21 inches through 36 inches, bell and spigot joint ends with gaskets.
- H. Plastic Pipe: ASTM F 949, Poly(Vinyl Chloride) (PVC) material, cell classification of 12454C or 12364A; corrugated pipe with smooth interior wall; inside nominal diameter of 24 inches through 36 inches, bell and spigot joint ends with gaskets.
- I. Joint Seals for Plastic Pipe: ASTM C 477 rubber compression gaskets for positive seal.
- J. Fittings: Same material as pipe, molded or formed to suit pipe size and end design, in required configurations.

### **2.02 CASING PIPE MATERIALS**

- A. Welded Steel Pipe: AWWA C 200, steel water pipe; diameter as indicated.
- B. Casing Insulators: fusion coated steel casing insulators with 12-inch wide band and 2-inch wide glass reinforced plastic runners; Model C12G-2, manufactured by Pipeline

Seal and Insulator, Inc. or acceptable equal.

- C. Casing End Seals: flexible S-shaped seals fabricated on synthetic rubber with stainless steel bands and clamps; Model S Pull-On End Seals, manufactured by Pipeline Seal and Insulator, Inc., or acceptable equal.

## **2.03 BEDDING AND COVER MATERIALS**

- A. Pipe Bedding Material: As specified in Section 02316S.
- B. Trench Backfill Material: As specified in Section 02316S.

## **PART 3 EXECUTION**

### **3.01 TRENCHING**

- A. See Section 02312S for trenching; Sections 02315S and 02316S for structural excavation and fill and backfill.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Backfill pipe zone with bedding material, tamp in place and compact; then complete backfilling of trench and compact.

### **3.02 INSTALLATION - SEWER PIPE**

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on project plan and profile drawings.
- B. Install pipe, fittings, and accessories in accordance with appropriate ASTM standards and manufacturer's instructions. Seal joints watertight.
- C. Install pipe to alignment and slope gradients noted on project drawings; with maximum variation from design alignment of 0.25 foot and from design elevations of 0.10 foot.

### **3.03 INSTALLATION - CASING PIPES**

- A. See Sections 02315S and 02316S for structural excavation and fill and backfill; and for additional requirements.
- B. Install casing pipes by ramming process where indicated; method to be acceptable to the Engineer.
- C. Install casing pipes at the line and grade as required to allow carrier pipes to be installed

within the casing pipes at the design line and grade, as indicated on the drawings.

- D. Place casing insulators on carrier pipes to properly center and position carrier pipe inside the casing pipes; space insulators as recommended by the pipe manufacturer.
- E. Seal each end of casing with appropriate size flexible end seals; install according to manufacturer's instructions and recommendations.
- F. Seal bore holes at each end, around periphery of casing, with grout, impervious clay or brick masonry, as acceptable to the Engineer.
- G. Contractor shall be solely responsible for the accuracy, safety and adequacy of construction methods and procedures for installing casing pipes, and for any damage which may result from their failure. All operations of the Contractor for installation of casing pipes shall be subject to approval by the agency having jurisdiction over the item being crossed, such as the Salt Lake County Flood Control department.
- H. Contractor shall enter any agreement with, and furnish any and all indemnity and other bonds that may be required by, the agency listed above, for their protection against injury and interference with flow of water caused by the operations of the Contractor.
- I. Contractor shall secure required permission from the agency listed above before commencing with the installation of casing pipes and related work along and across the respective areas.

### **3.04 CONNECT PROJECT PIPE INTO EXISTING SEWER MANHOLE**

- A. See Sections 02315S and 02316S for structural excavation and fill and backfill.
- B. Connection of project pipe into existing sewer manhole shall include:
  - 1. All excavating required for the connection; and backfilling excavations after the connection is completed, and compacting backfill as required.
  - 2. Removing existing pipes where and if required.
    - a. Cleaning existing hole through wall and base of existing manhole; and preparing hole for connection, as required and as directed.
  - 3. Core-cutting hole through wall and base of existing manhole, where required, with appropriate size coring machine; and preparing hole for connection, as required and as directed.
  - 4. Installing new pipe in place and connecting to manhole wall with appropriate type flexible coupling, as recommended by the coupling manufacturer.
  - 5. Reforming manhole floor and invert channel to provide smooth channel transitions to accommodate new connected pipes.
  - 6. Sealing around new pipes, where it intersects manhole wall, on the exterior and interior of the manhole; make connection watertight.
  - 7. Perform all other operations necessary to restore existing manhole to condition acceptable to the Owner.



- C. If existing manhole does not have steps, connection shall also include furnishing and installing new manhole steps. Steps shall be installed as described in Section 02640S, Manholes.
- D. Provide temporary facilities to divert existing sewer flow around work areas as described in Supplemental General Conditions of these specifications.

### **3.05 SEWER SERVICE CONNECTIONS**

- A. Sewer service lines shall extend from a 4-inch or 6-inch wye branch placed in the sewer main, as indicated on the drawings or as directed by the Engineer.
  - 1. Normally, a 22 1/2 degree or 45 degree bend, rotated so that proper alignment and grade is established, shall be installed in the main line wye branch.
  - 2. In some instances, the bend may be omitted; and in some instances, two bends may be required.
- B. Sewer service lines shall extend to a location designated by the Engineer, which will be near the property line of the property to be served, or at the edge of a permanent easement, as indicated on the drawings and as directed.
- C. All pipe and fittings shall be heavy wall PVC sewer pipe conforming to the specifications found elsewhere in this Section.
- D. Installation:
  - 1. Each section of sewer main between any two manholes shall have the service lines extended within twenty days of completion of that portion of the main.
  - 2. Pipe and fittings for sewer service lines shall be installed as described herein and as directed by the Engineer.
  - 3. 4-inch sewer service lines shall be installed at a minimum slope of 1/4-inch per foot, which is about a 2.0 percent grade; unless approved otherwise by the Engineer. But in no case shall the slope be less than 1/8-inch per foot, which is about a 1.0 percent grade.
  - 4. Sewer service lines shall be installed at a uniform grade and alignment; and shall be free of low spots or adverse grades.
- E. Cleaning and Testing.
  - 1. Sewer service lines shall be cleaned, flushed and tested in accordance with applicable requirements of this Section.
  - 2. After flushing and testing have been completed, the end of the service line shall be permanently plugged.

### **3.06 CONSTRUCTING COLLARS AROUND EXISTING MANHOLE COVERS**

- A. Construct collars around existing manhole covers after street pavement has been

restored.

- B. Collars shall be constructed according to City standards.

### **3.07 FIELD QUALITY CONTROL**

- A. Clean and Flush new sewer pipe as follows.
1. Take every precaution to prevent dirt, grease, and all other foreign matter from entering each length of pipe before making connections in field.
  2. After each section of piping is installed, it shall be thoroughly cleaned to remove rocks, dirt, and other foreign matter by washing, sweeping, scraping or other methods that will not harm lining of pipe.
  3. For safety and to prevent rocks and other foreign matter from entering pipe, all open ends of pipe shall be plugged when workmen are not on the job or in the immediate area.
  4. All sections of sewer lines between manholes and sewer laterals extending from the sewer main shall be completely flushed.
    - a. Pipe 12 inch diameter and larger shall be flushed at a rate of 3.0 feet per second.
    - b. Pipe under 12 inch diameter shall be flushed at a rate of 4.0 feet per second.
  5. Water required for flushing and testing shall be furnished by the Contractor.
  6. All temporary cross-connections for flushing and drainage shall be furnished, installed, and subsequently removed by the Contractor after completion of the operation.
- B. Perform field inspection and testing in accordance with Specifications.
- C. Pipe installation shall be inspected by the Engineer prior to backfilling of trench; backfilling will be done only after it is authorized by the Engineer.
- D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
- E. Test for Leakage: Test all pipe, fittings and other items for leakage, in presence of Engineer, after items have been cleaned. All joints, couplings, fittings shall be watertight.
1. Infiltration Test. Infiltration test required when pipe is below ground water level. Amount of water leaking into pipe shall be measured. Leakage for concrete pipe shall not be more than 10 gallons per day per inch diameter per mile of pipe; and for PVC sewer pipe shall not be more than one gallon per day per inch diameter per mile of pipe.
  2. Exfiltration Test. Exfiltration test required when pipe is above ground water level. The section of pipe being tested, including upstream manhole, shall be filled with water to not less than four feet nor more than eight feet above the lowest point of section being tested. Amount of water added during test period to maintain water level shall be measured. Amount of water added for concrete pipe shall not be more than 10 gallons per day per inch diameter per mile of pipe; and for PVC

sewer pipe shall not be more than one gallon per day per inch diameter per mile of pipe.

3. Air Test: Low pressure air test may be performed. Section of pipe being tested shall be sealed; line under test shall be pressurized to approximately 3.5 psi; and pressure allowed to stabilize for a minimum of two minutes. During this period air shall be added if the pressure drops below 3.5 psi. After this stabilization period, timing shall begin. The time of test, in minutes, shall be equal to the pipe diameter in inches. The maximum allowable pressure drop during the specified time period shall be 1.0 psi.
- F. Deflection Test, PVC Sewer Pipe: After PVC sewer pipe has been cleaned, perform deflection test on each section of pipe line between manholes. The maximum allowable pipe deflection, the reduction in vertical inside diameter, shall be 5 percent. Maximum allowable deflection shall be applied to the base inside diameters shown in Table 63, Base Inside Diameters For Deflection Measurements of ASTM D 3034 SDR35 PVC Sewer in the Uni-Bell "Handbook of PVC Pipe", to determine minimum permissible diameter, or other appropriate sources. Testing devices shall include deflectometer, calibrated television or photography, or properly sized mandrel or sewer ball.
- G. Televiser Sewer Lines. After pipe lines have been tested for leakage and deflection, the main sewer lines shall be televised, along with appropriate narrative, by company specializing in this type work. The sewer lines shall be televised with water flowing in the lines; and with the Public Works inspector present. A copy of the videotape shall be provided to the City.

### **3.08 PROTECTION**

- A. Protect pipe and bedding material from damage or displacement until backfilling operation is in progress.

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02741M**

**HOT MIX ASPHALT (HMA)**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Products and procedures for laying, and compacting a surface course of one or more layers of HMA comprised of aggregate, asphalt binder, lime and other additives.
- B. Mix materials at a central mixing plant.

**1.2 RELATED SECTIONS**

- A. Section 01452: Profilograph and Pavement Smoothness
- B. Section 02742S: Project Specific Surfacing Requirements
- C. Section 02745: Asphalt Material
- D. Section 02746: Hydrated Lime
- E. Section 02748: Prime Coat/Tack Coat
- F. Section 02969: Optional Use of Reclaimed Asphalt Pavement (PG Binder Projects Only)

**1.3 REFERENCES**

- A. AASHTO R 35: Standard Practice for Superpave Volumetric Design for Hot-Mix Asphalt (HMA)
- B. AASHTO T 11: Materials Finer Than 75  $\Phi$ m (No. 200) Sieve in Mineral Aggregates by Washing
- C. AASHTO T 19: Unit Weights and Voids in Aggregate
- D. AASHTO T 27: Sieve Analysis of Fine and Coarse Aggregates

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- E. AASHTO T 30: Mechanical Analysis of Extracted Aggregate
- F. AASHTO T 85: Specific Gravity and Absorption of Coarse Aggregate
- G. AASHTO T 89: Determining the Liquid Limit of Soils
- H. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils
- I. AASHTO T 96: Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine
- J. AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- K. AASHTO T 112: Clay Lumps and Friable Particles in Aggregate
- L. AASHTO T 166: Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated-Surface Dry Specimens
- M. AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
- N. AASHTO T 195: Determining Degree of Particle Coating of Bituminous-Aggregate Mixtures
- O. AASHTO T 209: Maximum Specific Gravity of Bituminous Paving Mixtures
- P. AASHTO T 255: Total Moisture Content of Aggregate by Drying
- Q. AASHTO T 304: Uncompacted Void Content of Fine Aggregate
- R. AASHTO T 308: Determining the Asphalt Binder Content of Hot-Mix Asphalt (HMA) by the Ignition Method
- S. AASHTO T 312: Method for Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- T. AASHTO T 324: Hamburg Wheel-Track testing of Compacted Hot-Mix Asphalt (HMA).
- U. AASHTO TP 61: Determining the Percentage of Fractured Particles in Coarse Aggregate
- V. AASHTO TP 62: Determining Dynamic Modulus of Hot-Mix Asphalt Concrete Mixtures

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- W. ASTM D 2950: Test Method for Density of Bituminous Concrete in Place by Nuclear Method
- X. ASTM D 3549: Thickness or Height of Compacted Bituminous Paving Mixture Specimens
- Y. ASTM D 3666: Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials
- Z. ASTM D 4561: Practice for Quality Control Systems for Organizations Producing and Applying Bituminous Paving Materials
- AA. ASTM D 5506: Standard Practice for Organizations Engaged in the Certification of Personnel Testing and Inspecting Bituminous Paving Materials
- BB. ASTM E 178: Practice for Dealing with Outlying Observations
- CC. ASTM E 1274: Standard Test Method for Measuring Pavement Roughness Using a Profilograph
- DD. UDOT Materials Manual of Instruction, Part 8
- EE. UDOT Minimum Sampling and Testing Guide
- FF. UDOT Performance Data Products Listing (PDPL)

### 1.4 ACCEPTANCE

- A. A lot equals the number of tons of HMA placed during each production day. The Department will:
  - 1. Divide each lot into four sublots based on the scheduled production day.
  - 2. Take random samples behind the paver before any further compaction (UDOT Materials Manual of Instruction Part 8-984: Sampling Methods), and determine random numbers/locations from a random numbers table or generator. (UDOT Materials Manual of Instruction Part 8-981: Random Sampling)
    - a. Dispute Resolution Sampling – Increase sample sizes to accommodate paired-T testing. Split additional material with contractor-designated lab and continue until testing discrepancies between labs are identified and resolved, as defined in article 1.6. (UDOT Materials Manual of Instruction Part 8: Chapter 4, Appendix C)
  - 3. Inform the Contractor of the time and place for the sample not more than 15 minutes prior to the sampling.
  - 4. Conduct the following tests:
    - a. Asphalt Binder Content: One per sublot using ignition oven. AASHTO T 308

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- b. Aggregate gradation: One test per subplot on the residue of the ignition oven tests. AASHTO T 30.
    - c. VMA: 3 tests per lot. AASHTO T 312
    - d. Maximum Specific Gravity: Three per lot in conjunction with VMA determination. AASHTO T 209
  5. Use the average of the Maximum Specific Gravity tests for each lot to determine density of cores.
  6. Determine thickness of cores according to ASTM D 3549.
  7. Add the lot to the previous day's production if the minimum number of samples cannot be obtained for the final day's production and evaluate with the appropriate sample size.
  8. Add the lot to the next day's production if the minimum number of samples cannot be obtained, and evaluate with the appropriate sample size.
  9. Retest the lot if an individual test from a subplot is deemed an outlier based on ASTM E 178, with 90 percent confidence.
- B. The Engineer conducts the acceptance testing for asphalt binder content (AASHTO T 308), gradation (AASHTO T 30), VMA (AASHTO T 312), density (AASHTO T 166), and thickness (ASTM D 3549). For small projects with plan quantities of HMA less than 3000 tons or for work such as utility work, traffic signals, detours, lane leveling, etc., the Engineer may elect to accept material based upon visual inspection.
  1. When acceptance is intended to be based upon visual inspection, the Engineer reserves the option of conducting any acceptance tests necessary to determine the material and workmanship meets the project requirements.
- C. Obtain samples for density and thickness.
  1. Divide the lot into five sublots of approximately equal sizes.
  2. Obtain two cores per subplot, for a total of ten cores per lot, randomly as instructed, and in the presence of the Engineer within two days after the pavement is placed.(UDOT Materials Manual of Instruction Part 8-981: Random Sampling, UDOT Materials Manual of Instruction Part 8-984: Sampling Methods)
  3. If the random location for cores falls within one foot of the edge of the overall pavement section (outer part of shoulders), then move transversely to a point one foot from the edge of the pavement.
  4. Fill core holes with Hot Mix Asphalt or high AC content cold mix and compact.
  5. The Department takes possession of the cores immediately, and begins testing the cores within 24 hours for density acceptance.
- D. Density: The in-place target density for determining acceptance and incentive/disincentive is 93.5 percent of Maximum Specific Gravity density, AASHTO T 209, for projects where design overlay thickness is greater than 2 inches. For projects where design overlay thickness is 2 inches or less, in-place target density for determining acceptance and incentive/ disincentive is 92.5

percent of Maximum Specific Gravity density, AASHTO T 209. In-place density is based on cores obtained in paragraph C and tested in accordance with AASHTO T 166. For small projects, with plan quantities of HMA less than 3000 tons or for work such as utility work, traffic signals, detours, or lane leveling, and when material is to be accepted on the basis of visual inspection per article 1.4, paragraph B, acceptance for density may be based upon establishing and maintaining a roller pattern to obtain maximum density without over-stressing the pavement.

1. Use Table 4 with  $n = 10$  to determine PT for density.
2. When samples for gradation, asphalt binder content and VMA from lots are combined in order to obtain an appropriate sample size for evaluation, a lot for density determination is defined as the combined production days.

E. Thickness: Base acceptance on the average thickness of a lot. A thickness lot equals a density lot.

1. The same core samples taken for density will be used for thickness verification. ASTM D 3549.
2. The Department accepts a lot when:
  - a. The average thickness of all sublots is not more than 1/2 inch greater nor 1/4 inch less than the total thickness specified.
  - b. No individual subplot shows a deficient thickness of more than 3/8 inch.
  - c. Place additional materials where lots or sublots are deficient in thickness. The minimum depth of compacted surface for correcting deficient thickness is 3 times the nominal maximum aggregate size.
  - d. The Department pays for the quantity of additional material to bring the surface to design grade.
  - e. The Department does not pay for the quantity of additional material above the design grade due to the minimum paving thickness required.
  - f. The Engineer may allow excess thickness to remain in place or may order its removal. Remove and replace the entire depth of the course, if it is necessary to remove portions of the course.
  - g. The Department pays for 50 percent of the mix in excess of the +1/2 inch tolerance when excess thickness is allowed to remain in place.
  - h. The thickness tolerances established above do not apply to leveling courses. However, check final surfaces in stage construction.
  - i. Thickness acceptance for thin lift projects (2 inches or less) consists of checking thickness regularly with a depth probe during placement and taking corrective action as necessary.

F. Smoothness Tests

1. Determine acceptance and correct in accordance with Section 01452.



- G. Cease production
  - 1. When any two out of three consecutive lots meet one of the following criteria:
    - a. A net disincentive
    - b. Air voids at  $N_{des}$  averaged for each lot are less than 2.5 or greater than 4.5 percent
  - 2. Before production continues, submit a corrective action plan to the Engineer indicating the changes in production procedures that will be implemented to correct the deficiencies.
- H. The Department pays incentive/disincentive on the assessed quantities of HMA according to Table 1 Incentive/Disincentive for Gradation, Asphalt Binder Content and Density or Table 2 Incentive/Disincentive for VMA. Base the incentive/disincentive on Percent Within Limit (PT) computation using Tables 3, 4, and 5. Use lowest single value combined for gradation (each of the sieves) and asphalt binder content for calculating the gradation/asphalt binder content incentive/disincentive in Table 1.
  - 1. Meet PT of 88 or greater for density for eligibility for incentive in gradation/asphalt binder content and VMA. The Department does not pay incentive for gradation/asphalt binder content and VMA if the Contractor does not meet this condition.
  - 2. Incentives do not apply to the following:
    - a. Small projects with plan quantities of HMA less than 3000 tons
    - b. Work such as utility work, traffic signals, detours, or lane leveling.
  - 3. Incentives/Disincentives do not apply to material accepted on the basis of visual inspection per article 1.4.
- I. The Department rejects the lot if the Percent Within Limits (PT) for any individual measurement is less than 60 percent. Disincentive for reject lots is \$15.00/Ton deduction.
- J. To reduce over-testing of small quantity production days such as ramps or bridgework, the Engineer may, in concurrence with the Contractor, choose to combine production from several days to form a single lot.

<b>Table 1</b> <b>Incentive/Disincentive for Gradation, Asphalt Binder Content and Density</b>	
<b>PT Based on Min. Four Samples</b>	<b>Incentive/Disincentive (Dollars/Ton)</b>
> 99	0.91
96-99	0.74
92-95	0.41
88-91	0.07
84-87	-0.26
80-83	-0.60
76-79	-0.93
72-75	-1.27
68-71	-1.60
64-67	-1.93
60-63	-2.27
<60	Reject

<b>Table 2</b> <b>Incentive/Disincentive for VMA</b>	
<b>PT Based on Minimum Three Samples</b>	<b>Incentive/Disincentive (Dollars/Ton)</b>
> 99	0.49
96-99	0.39
92-95	0.18
88-91	-0.03
84-87	-0.24
80-83	-0.44
76-79	-0.64
72-75	-0.85
68-71	-1.06
64-67	-1.27
60-63	-1.47
<60	Reject

<b>Table 3</b> <b>Upper and Lower Limit Determination</b>	
<b>Parameter</b>	<b>UL and LL</b>
3/4 inch sieve for 1 inch HMA 1/2 inch sieve for 3/4 inch HMA 3/8 inch sieve for 1/2 inch HMA No. 4 sieve for 3/8 inch HMA	Target Value $\pm$ 6.0%
No. 8 sieve	Target Value $\pm$ 5.0%
No.50 sieve	Target Value $\pm$ 3.0%
No. 200 sieve	Target Value $\pm$ 2.0%
Asphalt Binder Content	Target Value $\pm$ 0.35%
VMA Production Range  Target Range (Field)  Target (Design)	Field Target Value $\pm$ 1.25%  12.5 % - 13.5 % for 1 inch 13.5 % - 14.5 % for 3/4 inch 14.5 % - 15.5 % for 1/2 inch 15.5 % - 16.5 % for 3/8 inch  Modified as necessary to meet field target range
Density	Lower Limit: Target Value - 2.0% Upper Limit: Target Value + 3.0%

**Table 4**  
**Quality Index Values for Estimating Percent Within Limits**

<b>PU/PL</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=6</b>	<b>n=7</b>	<b>n=8</b>	<b>n=10</b>	<b>n=12</b>	<b>n=15</b>	<b>n=20</b>
100	1.16	1.50	1.75	1.91	2.06	2.15	2.29	2.35	2.47	2.56
99	1.16	1.47	1.68	1.79	1.89	1.95	2.04	2.09	2.14	2.19
98	1.15	1.44	1.61	1.70	1.77	1.80	1.86	1.89	1.93	1.97
97	1.15	1.41	1.55	1.62	1.67	1.69	1.74	1.77	1.80	1.82
96	1.15	1.38	1.49	1.55	1.59	1.61	1.64	1.66	1.69	1.70
95	1.14	1.35	1.45	1.49	1.52	1.54	1.56	1.57	1.59	1.61
94	1.13	1.32	1.40	1.44	1.46	1.47	1.49	1.50	1.51	1.53
93	1.12	1.29	1.36	1.38	1.40	1.41	1.43	1.43	1.44	1.46
92	1.11	1.26	1.31	1.33	1.35	1.36	1.37	1.37	1.38	1.39
91	1.10	1.23	1.27	1.29	1.30	1.31	1.32	1.32	1.32	1.33
90	1.09	1.20	1.23	1.24	1.25	1.25	1.26	1.26	1.27	1.27
89	1.08	1.17	1.20	1.21	1.21	1.21	1.21	1.21	1.22	1.22
88	1.07	1.14	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17
87	1.06	1.11	1.12	1.12	1.12	1.13	1.13	1.13	1.13	1.13
86	1.05	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.05	1.05	1.04	1.04	1.04	1.04	1.04
84	1.02	1.02	1.02	1.01	1.01	1.01	1.00	1.00	1.00	1.00
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96	0.96	0.96	0.96
82	0.98	0.96	0.95	0.94	0.94	0.93	0.93	0.92	0.92	0.92
81	0.96	0.93	0.92	0.91	0.90	0.90	0.89	0.89	0.89	0.88
80	0.94	0.90	0.88	0.87	0.86	0.86	0.85	0.85	0.85	0.85
79	0.92	0.87	0.85	0.84	0.83	0.83	0.82	0.82	0.82	0.81
78	0.89	0.84	0.82	0.81	0.80	0.79	0.79	0.78	0.78	0.78
77	0.87	0.81	0.79	0.78	0.77	0.76	0.76	0.75	0.75	0.75
76	0.84	0.78	0.76	0.75	0.74	0.73	0.72	0.72	0.72	0.72
75	0.82	0.75	0.73	0.72	0.71	0.70	0.69	0.69	0.69	0.68
74	0.79	0.72	0.70	0.68	0.67	0.67	0.66	0.66	0.66	0.65
73	0.77	0.69	0.67	0.65	0.64	0.64	0.62	0.62	0.62	0.62
72	0.74	0.66	0.64	0.62	0.61	0.61	0.60	0.59	0.59	0.59
71	0.71	0.63	0.60	0.59	0.58	0.58	0.57	0.56	0.56	0.56
70	0.68	0.60	0.58	0.56	0.55	0.55	0.54	0.54	0.54	0.53
69	0.65	0.57	0.55	0.54	0.53	0.52	0.51	0.51	0.51	0.50
68	0.62	0.54	0.52	0.51	0.50	0.50	0.48	0.48	0.48	0.48
67	0.59	0.51	0.49	0.48	0.47	0.47	0.46	0.45	0.45	0.45
66	0.56	0.48	0.46	0.45	0.44	0.44	0.43	0.42	0.42	0.42
65	0.53	0.45	0.43	0.42	0.41	0.41	0.40	0.40	0.40	0.39
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37	0.37	0.37	0.37
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35	0.34	0.34	0.34
62	0.43	0.36	0.34	0.33	0.33	0.33	0.32	0.31	0.31	0.31
61	0.39	0.33	0.31	0.30	0.30	0.30	0.29	0.29	0.29	0.28
60	0.36	0.30	0.28	0.27	0.26	0.26	0.25	0.25	0.25	0.25
<60	≤ 0.35	≤ 0.29	≤ 0.27	≤ 0.26	≤ 0.25	≤ 0.25	≤ 0.24	≤ 0.24	≤ 0.24	≤ 0.24

Enter table in the appropriate sample size column and round down to the nearest value.

<b>Table 5</b> <b>Definitions, Abbreviations, and Formulas for Acceptance</b>	
<b>Term</b>	<b>Explanation</b>
Target Value (TV)	The target values for gradation, asphalt binder content and VMA are given in the Contractor's volumetric mix design. See article 1.4, D., for density target values.
Average (AVE)	The sum of the lot's test results for a measured characteristic divided by the number of test results; the arithmetic mean.
Standard Deviation (s)	The square root of the value formed by summing the squared difference between the individual test results of a measured characteristic and AVE, divided by the number of test results minus one. This statement does not limit the methods of calculations of s; other methods that obtain the same value may be used.
Upper Limit (UL)	The value above the TV of each measured characteristic that defines the upper limit of acceptable production. (Table 3)
Lower Limit (LL)	The value below the TV of each measured characteristic that defines the lower limit of acceptable production (Table 3)
Upper Quality Index (QU)	$QU = (UL - AVE)/s$
Lower Quality Index (QL)	$QL = (AVE - LL)/s$
Percentage of Lot Within UL (PU)	Determined by entering Table 4 with QU.
Percentage of Lot Within LL (PL)	Determined by entering Table 4 with QL.
Total Percentage of Lot (PL) Within UL and LL (PT)	$PT = (PU + PL) - 100$
Incentive/Disincentive	Determined by entering Table 1 and 2 with PT or PL.

All values for AVE, s, QU, and QL will be calculated to a minimum of four decimal place accuracy, which will be carried through all further calculations. Rounding to lower accuracy is not allowed.

## 1.5 LABORATORY CORRELATION

- A. To be eligible for dispute resolution, perform the following:
  - 1. Perform split-sample, paired-T testing with the Department based on project quality control testing using UDOT TTQP qualified lab.
    - a. Perform split-sample, paired-T analysis on all mix acceptance tests related to volumetric properties and the following background testing:
      - 1) Maximum Specific Gravity of Mix, AASHTO T 209
      - 2) Bulk Specific Gravity of Mix, AASHTO T 166
      - 3) Bulk Specific Gravity of Coarse Aggregates, AASHTO T 85

- b. Continue until attaining successful Paired-T test results, meeting  $\alpha = 0.05$ , for a minimum of two consecutive production days. (UDOT Materials Manual of Instruction Part 8: Chapter 4, Appendix C)
- B. Submit a detailed report showing tabular summaries of daily test data, paired-T calculations and any corrections made to account for failed comparisons.
- C. Submit summary prior to submitting engineering analysis for dispute resolution.

## **1.6 DISPUTE RESOLUTION**

- A. When disputing the validity of the Department's acceptance tests, submit an engineering analysis within one week of receipt of test results. Engineering Analyses will be accepted if based on test results performed by an AASHTO accredited lab that has performed a split-sample process with the Department.
- B. At a minimum, include the following items in the engineering analysis:
  - 1. Data supporting the Contractor's test results. Data must be based on project quality control testing.
    - a. Split-sample testing performed within the applicable contract
    - b. Test data disputed along with:
      - 1) Maximum Specific Gravity of Mix, AASHTO T 209
      - 2) Bulk Specific Gravity of Mix, AASHTO T 166
      - 3) Bulk Specific Gravity of Coarse Aggregates, AASHTO T 85
    - c. Successful Laboratory Correlation information, Article 1.5
  - 2. Procedures or issues leading to disputed acceptance test results.
  - 3. Determination of volumetric, durability and long-term structural properties from one or more of the following tests:
    - a. Hamburg Wheel Track Testing of Compacted Bituminous Mixtures; AASHTO T 324
    - b. Resistance of Compacted Bituminous Mixture to Moisture Damage; UDOT Materials Manual of Instruction Part 8-957.
    - c. Standard Test Method for Determining Rutting Susceptibility Using the Pavement Analyzer; UDOT Materials Manual of Instruction Part 8-958.
    - d. Dynamic Modulus Evaluation, AASHTO TP 62
    - e. PG Asphalt Binder Tests
    - f. AASHTO T 312
  - 4. Incentive/Disincentive calculations based on Contractor and Department test values.
  - 5. Recommendations for price adjustment based on expected long-term performance.

- C. When paving plans indicate that a reject lot will be covered within 48 hours, the Department immediately reviews the analysis to identify possible discrepancies that can be resolved through validation testing based on the following:
1. Department performs repeat testing on remaining material from original Department test.
  2. Department personnel perform repeat testing in the presence of Contractor representative within a 24 hour time period.
  3. Use results to validate or invalidate original Department result. Validation test results may not be used in lieu of acceptance results.
  4. Base validation on results within two standard deviations (project acceptance samples) of original acceptance result. Remove invalidated test results from acceptance lot and reevaluate lot based on reduced sample size.
  5. The Engineer reviews the results and notifies the Contractor of any findings that affect the reject status of the lot along with the Department's position on whether the lot is to be removed or may remain in place at the \$15.00/ton deduction for Reject Lot.
- D. Within three working days of receipt, the Resident Engineer, Region Materials Engineer, and Region Construction Engineer review the analysis and notify the Contractor in writing of acceptance or rejection. Notification of rejection includes the following:
1. Engineering basis for rejecting the Contractor's analysis, including specific points of objection.
  2. Department data and analysis to justify Department position.
  3. Time frame for removal of material or pay adjustment to be applied to the lot.
- E. When the Department concludes the engineering analysis has merit, the Department, in conjunction with the Contractor, immediately begins a review of the acceptance test results. The review includes, but is not be limited, to the following:
1. Independent Assurance review of all equipment and procedures and methods used for sampling, splitting, and testing.
  2. A review of the Department and Contractor's raw test data and calculations for documentation or calculation errors.
  3. Production and testing of additional correlation samples.
  4. Cross-witnessing of test procedures by Contractor Quality Control and Department personnel.
  5. Distribution of any other pertinent information.
  6. Discussion of other possible means for variation.

Note: If engineering analysis is initiated due to failure of statistical methods to verify Contractor testing and there is no net difference between incentive/disincentive based on Contractor or Department testing, the Engineer may verify contractor test values based on engineering analysis.

- F. Do not continue production without concurrence from the Engineer or until differences in the test results are resolved.
- G. If errors in testing or reporting are discovered, the Department corrects the applicable test results and re-applies the acceptance/pay adjustment procedures.
  - 1. If errors are identified that cannot be corrected and the quality of the lot is in question, the Department may choose to evaluate the lot using the Hamburg Wheel Tracker (AASHTO T 324), or the Asphalt Pavement Analyzer (UDOT Materials Manual of Instruction Part 8-958: Standard Test Method for Determining Rutting Susceptibility using the Pavement Analyzer).
    - a. Use 5 stratified random samples cut from the roadway
    - b. The Region Materials Engineer and Resident Engineer decide, in conjunction with the Contractor, the status of the lot and associated pay adjustment, based on the following:
      - 1) Fatigue Life
      - 2) Stripping Potential
      - 3) Rutting Potential
      - 4) Expected Pavement Performance Period vs. Design Life
  - 2. Errors that are identified within the Department's testing result in a review of the Contractor's schedule and if appropriate, make adjustments to the CPM.
- H. If errors in testing cannot be identified, select an Independent Third Party (Agreed upon by the Department and the Contractor) to witness sample splitting and testing by both the Contractor and the Department. The Independent Third Party identifies/produces additional material for split-sample testing.
- I. If testing errors are identified by the Third Party, the Department makes appropriate adjustments to the acceptance test results and re-applies the acceptance/pay adjustment procedures.
- J. The party responsible for the identified error pays for the services of the Independent Third Party.
- K. If no errors are identified, the Department evaluates the lot using the original testing results.

## **PART 2 PRODUCTS**

### **2.1 ASPHALT BINDER**

- A. Refer to Section 02742S, Project Specific Surfacing Requirements.
- B. Asphalt Material as per Section 02745.



- C. Adhere to UDOT Minimum Sampling and Testing Guide Quality Management Plan 509: Asphalt Binder Quality Management System sampling, testing and handling of Asphalt Binder.

## **2.2 AGGREGATE**

- A. Refer to the UDOT Minimum Sampling and Testing Guide for testing frequencies.
- B. Crusher processed virgin aggregate material consisting of crushed stone, gravel, or slag. Conform to Section 02969 for recycled mixes.
- C. Use the following requirements, including Table 6, to determine the suitability of the aggregate.
  - 1. Coarse aggregates:
    - a. Retained on No. 4 sieve.
  - 2. Fine aggregates:
    - a. Clean, hard grained, and angular.
    - b. Passing the No. 4 sieve.

<b>Table 6</b> <b>Aggregate Properties - HMA</b>			
<b>Test Method</b>	<b>Test No.</b>	<b>Category 1</b>	<b>Category 2</b>
One Fractured Face	AASHTO TP 61	95% min.	85% min. (1 inch and 3/4 inch), and 90% min. (1/2 inch and 3/8 inch)
Two Fractured Face	AASHTO TP 61	90% min.	80% min. (1 inch and 3/4 inch), and 90% min. (1/2 inch and 3/8 inch)
Fine Aggregate Angularity	AASHTO T 304	45 min.	45 min.
Flakiness Index	UDOT MOI 933 (Based on 3/8 inch sieve and above)	17% max.	17% max.
L.A. Wear	AASHTO T 96	35% max.	40% max.
Sand Equivalent	AASHTO T 176 (Pre-wet method)	60 min.	45 min.
Plasticity Index	AASHTO T 89 and T 90	0	0
Unit Weight	AASHTO T 19	min. 75 lb/cu. ft.	min. 75 lb/cu. ft.
Soundness (sodium sulfate)	AASHTO T 104	16 % max. loss with five cycles	16 % max. loss with five cycles
Clay Lumps and Friable Particles	AASHTO T 112	2% max	2% max.
Natural Fines	N/A	0%	10% max.
Category 1: National Highway System and Truck Routes - Table 11. Category 2: All Other Routes			

- D. Meet gradation requirements in Table 7. AASHTO T 27/T 11

<b>Table 7</b> <b>Aggregate Gradations (Percent Passing by Dry Weight of Aggregate)</b>					
<b>Sieve Size</b>		<b>1 inch</b> (SHRP 25 mm)	<b>3/4 inch</b> (SHRP 19 mm)	<b>1/2 inch</b> (SHRP 12.5 mm)	<b>3/8 inch</b> (SHRP 9.5 mm)
<b>Control Sieves</b>	<b>1-1/2 inch</b>	100.0	-	-	-
	<b>1 inch</b>	90.0 - 100.0	100.0	-	-
	<b>3/4 inch</b>	<90	90.0 - 100.0	100.0	-
	<b>1/2 inch</b>	-	<90	90.0 - 100.0	100.0
	<b>3/8 inch</b>	-	-	<90	90.0 - 100.0
	<b>No. 4</b>	-	-	-	< 90
	<b>No. 8</b>	19.0 - 45.0	23.0 - 49.0	28.0 - 58.0	32.0 - 67.0
	<b>No. 200</b>	1.0 - 7.0	2.0 - 8.0	2.0 - 10.0	2.0 - 10.0

## 2.3 HYDRATED LIME

- A. Meet the requirements of Section 02746.

## 2.4 VOLUMETRIC DESIGN

- A. Comply with all requirements for Superpave Volumetric Mix Design according to UDOT Materials Manual of Instruction Part 8-964: Guidelines for Superpave Volumetric Mix Design and the following:
1. Meet the requirements of Table 8 and Table 9.
  2. Use a laboratory qualified by UDOT Central Materials in the use of the Superpave Gyratory Compactor.
  3. Use a Superpave Gyratory Compactor approved in accordance with UDOT Materials Manual of Instruction Part 8-961: Guidelines for Superpave Gyratory Compactor Protocol.
  4. Meet all volumetric mix design requirements for the selected target gradation.
- B. Submit the Volumetric Mix Design data for verification at least 10 working days before beginning paving. Do not begin paving until verification is complete.
1. Include all information regarding selection of design aggregate structure showing the target values of percent passing on all sieves listed in Table 3 and Table 7, and the design asphalt binder content.
  2. Provide information that aggregate proposed for use meet the requirements of Table 6.
  3. Supply QC data for target job mix gradation selection. Use those target values for price adjustments.

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4. After the design is complete, run four sets of two Gyratory specimens at the design asphalt binder content to verify the optimum asphalt and all other design requirements.
- C. Moisture Susceptibility
1. Incorporate hydrated lime into all volumetric designs. Use 1 percent, minimum, for Method A and 1½ percent, minimum for Method B (Section 02746).
- D. Designate asphalt binder supplier.
- E. Use gyratory mixing and compaction temperatures supplied by the Engineer.
- F. The Department Region Materials Lab verifies the Volumetric Mix Design. UDOT Materials Manual of Instruction Part 8-960: Guidelines for Superpave Volumetric Mix Design. For small projects with plan quantities of HMA less than 3000 tons, or for work such as utility work, traffic signals, detours, or lane leveling, the Region Materials Engineer may accept the Volumetric Mix Design from data submitted with the proposed mix design or from a previous mix design. The Region Materials Engineer reserves the right to verify any mix design submitted.
- G. Comply with the following requirements for Superpave volumetric mix design:

<b>Table 8</b>				
<b>Volumetric Design Gyration</b>				
<b>20 Years Design ESALS (Million)</b>	<b>Compaction Parameters</b>			<b>Voids Filled with Asphalt (VFA) (%)</b>
	<b>N<sub>initial</sub> /% of G<sub>mm</sub> *</b>	<b>N<sub>design</sub> /% of G<sub>mm</sub> *</b>	<b>N<sub>max</sub> /% of G<sub>mm</sub> *</b>	
0.3	6/≤ 91.5	50/ ≥ 96.5	75/≤ 98	70 - 80 **
0.3 to <3	7/≤ 90.5	75/ ≥ 96.5	115/≤ 98	70 - 80
3 to < 30	8/≤ 89	100/ ≥ 96.5	160/≤ 98	70 - 80
≥ 30	9/≤ 89	125/ ≥ 96.5	205/≤ 98	70 - 80

\* G<sub>mm</sub>: Maximum specific gravity of Mix. (Rice Method)

\*\* 67 percent specified lower limit VFA for 1 inch nominal maximum size mixture.

<b>Table 9</b>	
<b>Volumetric Design Requirements</b>	
HMA design mixing and compaction temperatures	Provided by the Engineer
Dust Proportion Range	0.6 - 1.40
Voids in Mineral Aggregate (VMA) at N <sub>design</sub> AASHTO R 35.9.2, using G <sub>sb</sub> at SSD.	Select Design Target such that Field Performance meets Field Target

Equation based on percent of total mix.	requirements (Submit calculations or documentation to substantiate)
Hamburg Wheel Tracker AASHTO T-324	Maximum 10 mm impression at 20,000 cycles.

- H. Prepare and submit two sets (five samples each) of ignition oven calibration samples.
  - 1. Department uses these samples to determine the correction factors for the Region and Field lab ignition oven.
  - 2. Submit samples a minimum of three working days prior to paving.

## 2.5 CONTRACTOR INITIATED CHANGES IN MIX DESIGN

- A. Submit all requests, in writing to Engineer, at least 12 hours prior to incorporating changes into production.
- B. Submit a field volumetric mix design for all target changes with the exception of the initial establishment of VMA field target. Field target for VMA may be adjusted once, without submission of new mix design, after production of first paving lot.
  - 1. Include documentation supporting correlation between suggested target changes and mix design volumetric requirements. Department acceptance and/or Contractor QC testing data is acceptable.
  - 2. Field volumetric mix design verification consists of three sets of two gyratory specimens run at the new target gradation and/or asphalt binder content. The Department's previous acceptance tests are acceptable for field verification.
  - 3. If the field volumetric mix design meets the volumetric requirements, the Engineer, in consultation with the Region Materials Engineer, provides written concurrence of the verified field volumetric mix design.
  - 4. If the field volumetric mix verification does not meet the volumetric requirements, submit a new laboratory volumetric mix design from a laboratory qualified by UDOT Central Materials. Allow at least four working days for verification.
  - 5. The Department performs up to two volumetric mix design verifications at no cost to the Contractor. The Department charges \$3000 for each additional laboratory and/or field verification required, including all laboratory or field volumetric mix design verifications required due to contractor initiated target changes.
- C. Submit a new laboratory volumetric mix design if changes occur in the aggregate source, asphalt binder source or grade.
- D. Do not make changes to production mix until request is reviewed and verified.

## **PART 3      EXECUTION**

### **3.1      ADDING HYDRATED LIME**

- A.      Method A, Lime Slurry; or Method B, Lime Slurry Marination: Refer to Section 02746.

### **3.2      HMA**

- A.      Dry aggregate to an average moisture content of not more than 0.2 percent by weight. Verified by AASHTO T 255. Adjust burners to avoid damage or soot contamination of the aggregate.
- B.      Coat with asphalt binder 100 percent of the particles passing and 98 percent of the particles retained on the No. 4 sieve.
  - 1.      Verified by AASHTO T 195.
  - 2.      Discontinue operation and make necessary corrections if material is not properly coated.
- C.      Maintain temperature of the HMA between identified limits for mixing and compaction, as defined on Volumetric Mix Design Verification Letter.
  - 1.      Department rejects materials heated over the identified limits.
  - 2.      Remove all material rejected by the Department for overheating.

### **3.3      HMA PLANT**

- A.      Provide:
  - 1.      Positive means to determine the moisture content of aggregate.
  - 2.      Positive means to sample all material components.
  - 3.      Sensors to measure the temperature of the HMA at discharge.
  - 4.      The ability to maintain discharge temperature of the mix in accordance with the mix design.
- B.      Asphalt Binder Storage Tanks:
  - 1.      Provide calibrated tanks so the quantity of material remaining in the tank can be determined at any time.
  - 2.      Provide a positive means of sampling the asphalt binder from the tanks.

### **3.4      SURFACE PREPARATION**

- A.      Locate, reference, and protect all utility covers, monuments, curb and gutter, and other components affected by the paving operations.
- B.      Remove all moisture, dirt, sand, leaves, and other objectionable material from the prepared surface before placing the mix.

- C. Complete spot leveling 48 hours before placing pavement courses.
  - 1. Place, spread, and compact leveling mix on portions of the existing surface.
  - 2. Fill and compact any localized potholes more than 1 inch deep.
- D. Allow sufficient cure time for prime coat/tack coat prior to placing HMA. Refer to Section 02748.

### **3.5 SURFACE PLACEMENT**

- A. When full-width or echelon paving is impractical and more than one pass is required, provide a 3:1 (horizontal to vertical) sloped edge adjacent to the next lane to be paved.
- B. Adjust the production of the mixing plant and material delivery until a steady paver speed is maintained.
- C. Offset longitudinal joints 6 to 12 inches in succeeding courses.
  - 1. Place top course joint within one foot of the centerline or lane line.
  - 2. If the previous pass has cooled below 175 degrees F, tack the longitudinal edge before placing the adjacent pass.
- D. Offset transverse construction joints at least 6 ft longitudinally to avoid a vertical joint through more than one course.
- E. Do not allow construction vehicles, general traffic, or rollers to pass over the uncompacted end or edge of freshly placed mix until the mat temperature drops to a point where damage or differential compaction will not occur.
- F. Taper the end of a course subjected to traffic at approximately 50:1 (horizontal to vertical).
  - 1. Make a transverse joint by saw or wheel cutting and removing the portion of the pass that contains the tapered end.
  - 2. Tack the contact surfaces before fresh mix is placed against the compacted mix.
- G. Use a motor grader, spreader box, or other approved spreading methods for projects under 180 yd<sup>2</sup>, irregular areas, or for miscellaneous construction such as detours, sidewalks, and leveling courses.

### **3.6 COMPACTION**

- A. Use a small compactor or vibratory roller in addition to normal rolling at structures.
- B. Operate in a transverse direction next to the back wall and approach slab.

### **3.7 LIMITATIONS**

- A. Do not place HMA on frozen base or subbase.
- B. Use a UDOT approved release agent for all equipment and hand tools used to mix, haul, and place the HMA. Select from the Performance Data Products Listing (PDPL) maintained by the UDOT Research Division.
- C. Do not place HMA during adverse climatic conditions, such as precipitation, or when roadway surface is icy or wet.
- D. Place HMA from April 15, and October 15, and when the air temperature in the shade and the roadway surface temperature are above 50 degrees F.
  - 1. The Department determines if it is feasible to place HMA outside the above limits. Obtain written approval from the Engineer prior to paving from October 15, to April 15.

### **3.8 CONTRACTOR QUALITY CONTROL**

- A. General
  - 1. Reference the following standards for qualification, control, and guidelines:
    - a. ASTM D 3666
    - b. ASTM D 4561
    - c. ASTM D 5506
  - 2. Include the following tests in ASTM D 5506, Part 2, “Referenced Documents,” for the following:
    - a. AASHTO T 308
    - b. AASHTO T 312, PP 28
    - c. ASTM E 1274
  - 3. Establish and maintain a quality control system providing assurance that materials and completed construction conform to Contract requirements.
  - 4. Identify the Quality Control Manager by name. The Quality Control Manager implements and maintains the Quality Control Plan.
  - 5. Provide the Engineer a certification stating that all the testing equipment to be used is properly calibrated and meets the specifications applicable for the specified test procedures. Provide evidence that Technicians are UDOT TTQP qualified. The Engineer may require the Contractor’s technician to perform testing of samples to demonstrate an acceptable level of performance.
- B. Quality Control Plan (QCP)
  - 1. Provide and maintain a Quality Control Plan covering all personnel, equipment, supplies, and facilities necessary to obtain samples, perform and document tests, and otherwise provide a quality product.



2. Submit the written QCP to the Engineer at least 10 days before beginning operations, or at the Preconstruction Conference.
  3. The Department makes no partial payments for materials that are subject to specific quality control requirements without a QCP.
  4. The Contractor or independent organization may operate the QCP. However, the Contractor is responsible for the QCP's administration, including compliance with the QCP and any modifications.
  5. Address the following minimum items:
    - a. Quality control organization chart and area of responsibility and authority of each individual.
    - b. Names and qualifications of personnel as required by this Article.
    - c. Provide a description of outside organizations and their services (such as testing laboratories) if employed.
    - d. Tests required to be performed, the frequency of testing, sampling locations, and location of the testing facilities.
    - e. Documentation of test procedures verifying that tests are conducted in accordance with the testing plan, and that proper corrective actions are taken when required.
    - f. Procedures for verifying that testing equipment is available, complies with specified standards, and is calibrated against certified standards.
    - g. Procedures for verifying that tests are conducted in accordance with the appropriate ASTM and AASHTO standards.
    - h. Procedures for submitting test results to the Engineer daily.
  6. QCP elements: address all elements that affect the quality of the HMA including:
    - a. Mix Design
    - b. Aggregate Grading
    - c. Quality of Materials
    - d. Stockpile Management
    - e. Proportioning
    - f. Mixing
    - g. Placing and Finishing
    - h. Sampling and Testing Procedures
    - i. Joints
    - j. Compaction
    - k. Surface smoothness
- C. Quality Control Organization
1. Implement the QCP by:
    - a. Establishing a separate Quality Control Organization.
    - b. Developing an organization chart to show all quality control personnel and how these personnel integrate with other management, production, and construction functions and personnel.
  2. Identify all quality control staff on the organization chart by name and function, and indicate the total staff required to implement all elements of

- the quality control programs, including inspection and testing functions for different items of work.
3. If an outside organization or laboratory is used to implement all or part of the QCP, the personnel assigned are subject to the qualification requirements of this Section. Indicate on the organization chart which personnel are contractor employees and which are provided by an outside organization.
- D. Quality Control Organization Personnel Requirements
1. As outlined in ASTM D 3666, Part 7, with the following modifications.  
Quality Control Manager:
    - a. Institutes any actions necessary to successfully operate the QCP in compliance with specifications.
    - b. Reports directly to a responsible officer in the Contractor's organization.
    - c. May supervise the QCP on more than one project provided that the Quality Control Manager can be at the job site within one hour after being notified of a problem.
  2. Qualification of Personnel. As outlined in ASTM D 3666 with the following changes:
    - a. Provide a sufficient number of quality control technicians to adequately implement the QCP. These personnel will be either engineers or engineering technicians qualified by UDOT TTQP.
  3. Quality Control Technicians:
    - a. Report directly to the Quality Control Manager.
    - b. Inspect all plant equipment used in proportioning and mixing to verify proper calibration and operating condition.
    - c. Perform quality control tests necessary to adjust and control mix proportioning in accordance with the job mix formula.
    - d. Inspect all equipment used in placing, finishing, and compaction to verify proper operating condition.
    - e. Inspect all construction operations to verify conformance with the specifications.
    - f. Perform all quality control testing as required within this article.
    - g. Detail the criteria to be used in initiating correction of unsatisfactory production processes and construction practices.
- E. Quality Control Testing Laboratory
1. Reference ASTM D 4561 with the following additions:
    - a. Provide a fully equipped asphalt laboratory located within 30 minutes travel time of the plant or job site.
    - b. Keep laboratory facilities clean and all equipment maintained in proper working condition.
    - c. Permit the Engineer unrestricted access to inspect the quality control testing laboratory facility and witness quality control activities. The Department advises in writing of any noted

- deficiencies concerning the laboratory facility, equipment, supplies or testing personnel and procedures.
  - d. Suspend work when test results indicate materials are out of specification tolerances. Resume only when the deficiencies are corrected.
    - 1) Perform quality audits under this standard.
    - 2) Refer to UDOT Quality Assurance Manual.
  - 2. Sampling:
    - a. Use a statistically based procedure of random sampling, independent of UDOT's random acceptance sampling determinations. (UDOT Materials Manual of Instruction Part 8-981: Random Sampling)
    - b. The Engineer has the right to witness all sampling.
  - 3. Noncompliance:
    - a. When quality control activities do not comply with either the Quality Control Program or the Contract provisions, or failure to properly operate and maintain an effective Quality Control Program, the Engineer may:
      - 1) Order replacement of ineffective or unqualified personnel.
      - 2) Carry out the functions and operation of the approved Quality Control Program.
      - 3) Deduct costs incurred by the Department to operate the program or otherwise remedy the noncompliance from the total amount due the Contractor.
- F. Quality Control Testing
- 1. Perform all quality control tests necessary to control the production and construction processes applicable to these specifications and listed in the QCP.
  - 2. Establish a testing program to control as a minimum: asphalt binder content, aggregate gradation, VMA, temperatures, aggregate moisture, field compaction, and surface smoothness.
  - 3. Monitoring: The Department reserves the right to monitor any QC testing.
  - 4. Follow the requirements of Table 10, and conduct any additional testing to control the process.

<b>Table 10</b> <b>Quality Control Testing for HMA</b>	
<b>Testing Method/ Acceptance Documentation</b>	<b>Testing Frequency</b>
AASHTO T 308 <b>Asphalt binder content:</b> by the ignition method	Minimum 4 tests per lot **
AASHTO T 30 <b>Gradation:</b> Mechanical analysis of the remains of the Ignition test.	Minimum 4 tests per lot
AASHTO T 255	Minimum

<b>Table 10</b> <b>Quality Control Testing for HMA</b>	
<b>Moisture content:</b> of aggregate used in production by drying	One test per lot
<b>Temperature</b> for: dryer, bitumen in the storage tank, mixture at the plant, and mixture at the job site.	Record at least four times per lot
ASTM D 2950 <b>In-place Density Monitoring</b> Conduct all testing necessary to meet density requirements.	Minimum 10 density determinations per lot
AASHTO T 312, R 35 <b>Field Gyratory Specimens</b> Verify mix design parameters meet Job-mix requirements, and adjust mix as needed to meet parameters. Mold field gyratory specimens at mix design temperatures determined by the Engineer.	Minimum of one determination (two Gyratory specimens each) of VMA and Air Voids for each lot.

\*\* A lot is defined in article 1.4

G. Control Charts

1. Maintain daily linear control charts both for mean and range. Include in charts aggregate gradation, asphalt binder content, stockpile gradation, VMA, density and in-place air voids.
2. Post control charts daily in a location satisfactory to the Engineer. As a minimum, identify:
  - a. Project number
  - b. Contract item number
  - c. Test number
  - d. Each test parameter
  - e. Test results
3. Use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the projected data during production indicates a problem and no corrective action is taken, the Engineer may suspend production or acceptance of the material.

H. Quality Control Reports

1. Maintain records and submit daily reports of quality control activities.

<b>Table 11</b> <b>National Highway System and Truck Routes</b> <b>Category 1</b>		
<b>Interstate Routes</b>	<b>Beginning</b>	<b>Ending</b>
<b>1-15</b>	Arizona State Line	Idaho State Line

**Table 11**  
**National Highway System and Truck Routes**  
**Category 1**

<b>Interstate Routes</b>	<b>Beginning</b>	<b>Ending</b>
<b>1-70</b>	Jct I-70 - Cove Fort	Colorado State Line
<b>1-80</b>	Nevada State Line	Wyoming State Line
<b>1-84</b>	Idaho State Line	Jct I-80 - Coalville
<b>1-215</b>	Jct I-80 - Parleys Canyon	Jct I-15 - North Salt Lake
<b>US Routes</b>		
<b>US-6</b>	Nevada State Line	Jct US-50 - Delta
<b>US-6</b>	Jct I-15 - Spanish Fork	Jct I-70 - Green River
<b>US-40</b>	Jct I-80 - Park City	Colorado State Line
<b>US-50</b>	Jct US-6 - Delta	Jct I-15 - Holden
<b>US-89</b>	Arizona State Line	Jct I-70 - Sevier
<b>US-89</b>	Jct I-70 - Salina	Jct SR-28 - Gunnison
<b>US-89</b>	Jct US-6 - Spanish Fork	Jct SR-73 - Lehi
<b>US-89</b>	SR-71 - Draper	Jct SR-269 - 5 <sup>th</sup> and 6 <sup>th</sup> South
<b>US-89</b>	Jct I-15 - Farmington	Jct I-80 - Uintah
<b>US-89</b>	Jct I-84 - Uintah	Jct SR-134 - North Ogden
<b>US-89</b>	Jct US-91 - Logan	Idaho State Line
<b>US-91</b>	Jct I-15 - Brigham City	Jct US-89 - Logan
<b>US-189</b>	Jct I-15 - South Provo	Jct US-40 - Heber City
<b>US-191</b>	Arizona State Line	Jct I-70 - Thompson
<b>US-666</b>	Jct US-191 - Monticello	Colorado State Line

<b>State Routes</b>	<b>Beginning</b>	<b>Ending</b>
<b>SR-9 - Zions Park</b>		
<b>SR-10 - Castle Valley</b>	Jct I-70 - Fremont Jct	Jct US-6 - Price
<b>SR-12 - Bryce Canyon</b>	Jct US-89 - Panguitch	Jct SR-63 - Bryce Canyon
<b>SR-26 - Riverdale Road</b>	Jct I-15 - Exit 342	Jct US-89 - Ogden
<b>SR-28 - Levan Desert</b>	Jct US-89 - Gunnison	Jct I-15 - South Nephi
<b>SR-31 - Huntington</b>	Mile Post 33	Mile Post 49
<b>SR-36 - Tooele Access</b>	Jct entrance - Tooele Army Depot	Jct I-80 - Tooele Interchange
<b>SR-39 - 20<sup>th</sup> and 21<sup>st</sup> Ogden</b>	Jct I-15 - Exit 344	Jct SR-203 - Harrison Blvd
<b>SR-52 - 8<sup>th</sup> North, Orem</b>	Jct I-15 - Orem	Jct US-189 - Olmstead Jct

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<b>State Routes</b>	<b>Beginning</b>	<b>Ending</b>
<b>SR-57 - Orangeville Bypass</b>	Jct SR-10 - Hunter Power Plant	Entrance - Wilberg Coal Mine
<b>SR-71 - 7<sup>th</sup> and 9<sup>th</sup> East Street, Salt Lake City</b>	Jct SR0-209 - 90th South Street	Jct SR-186 - 4 <sup>th</sup> South Street
<b>SR-73 - Lehi Connection</b>	Jct I-15 - South Lehi	Jct US-89 - South Lehi
<b>SR-79 - 12<sup>th</sup> Street Ogden</b>	Jct I-15 - Exit 347	Jct SR-203 - Harrison Blvd.
<b>SR-96 - Scofield Access</b>	Mile Post 3	Mile Post 4
<b>SR-111 - Bacchus Highway</b>	Jct SR-48 - Bingham Highway	Jct SR-201 - 21 <sup>st</sup> South Expressway
<b>SR-134 - 2700 North</b>	Jct I-15 - North Ogden, Exit 352	Jct US-89 - North Ogden
<b>SR-152 - Van Winkle Expressway</b>	Jct SR-71 - 9th East Street	Jct I-215 - East (Exit 8)
<b>SR-154 - Bangerter Highway</b>	Jct I-15 - Draper	Jct I-80 - Salt Lake Intl Airport
<b>SR-171 - 33<sup>rd</sup> and 35<sup>th</sup> South, Salt Lake City</b>	Jct SR-172 - 56 <sup>th</sup> West Street	Jct I-215 - East, Exit 3
<b>SR-172 - 56<sup>th</sup> West Street Salt Lake City</b>	Jct 6200 South - Kearns	Jct I-80 - International Center
<b>SR-186 Foothill Blvd</b>	Jct SR-71 - 7 <sup>th</sup> East Street, SLC	Jct I-215 - East (Exit 1)
<b>SR-190 - Big Cottonwood</b>	Jct I 215 - East, Exit 7, SLC	Jct SR-210 - Little Cottonwood
<b>SR-201 - 21<sup>st</sup> South Expressway</b>	Jct I-80 - Lake Point	Jct I-15 - South Salt Lake
<b>SR-203 - Harrison Blvd</b>	Jct US-89 - South Ogden	Jct SR-39 - 12 <sup>th</sup> Street
<b>SR-209 - 90<sup>th</sup> &amp; 94<sup>th</sup> South</b>	Jct SR-68 - Redwood Road (SLC)	Jct SR-210 - Little Cottonwood
<b>SR-210 - Little Cottonwood</b>	Jct SR-190 - Big Cottonwood	Jct SR-209 - 90 <sup>th</sup> and 96 <sup>th</sup> South
<b>SR-264 - Skyline Mine Road</b>	Mile Post 12	Mile Post 15
<b>SR-265 - University Parkway</b>	Jct I-15 - Exit 272	Jct I-215 East, Exit 5
<b>SR-266 - 45<sup>th</sup> &amp; 47<sup>th</sup> South Taylorsville</b>	Jct I-215 - West, Exit 15	Jct I-215 - East, Exit 5
<b>SR-269 - 5<sup>th</sup> &amp; 6<sup>th</sup> South Salt Lake City</b>	Jct I-215, Exit 310	Jct SR-71 - 7 <sup>th</sup> East Street

END OF SECTION

January 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02742S**

**PROJECT SPECIFIC SURFACING REQUIREMENTS**

**Add Section 02742:**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Required PG Asphalt or emulsion.
- B. Number of gyrations to use for Superpave Mix Design.

**PART 2 PRODUCTS**

**2.1 MIXES**

- A. Hot Mix Asphalt (HMA): (Refer to bid item for size)
  - 1. PG 64 - 34 Asphalt.
  - 2. N<sub>initial</sub> 8 N<sub>design</sub> 10 N<sub>final</sub> 160
- B. Open-Graded Surface Course:
  - 1. PG 64 - 34 Asphalt.
- C. Chip Seal
  - 1. Type of asphalt emulsion \_\_\_\_\_

**PART 3 EXECUTION Not used**

**END OF SECTION**

**Supplemental Specification  
2005 Standard Specification Book**

**SECTION 02745**

**ASPHALT MATERIAL**

**Delete Section 02745 and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Asphalt materials

**1.2      PAYMENT PROCEDURES**

- A.      Price adjustments for asphalt cement and liquid asphalt (chip-seal emulsions and/or cut-backs):
  - 1.      Standard department procedures governs price adjustments made where asphalt material does not conform to the specifications
    - a.      If the price adjustment exceeds 30 percent, the Engineer may order the removal of any or all the defective asphalt material.
    - b.      The pay factor for such material is 0.50 when allowed to remain in place.
- B.      Price adjustments for Performance Graded Asphalt Binder (PGAB):
  - 1.      Standard department PGAB management plan governs price reductions or removal of material where the binder does not conform to the specifications.

**1.3      REFERENCES**

- A.      AASHTO M 81: Cut-Back Asphalt (Rapid-Curing Type)
- B.      AASHTO M 82: Cut-Back Asphalt (Medium-Curing Type)
- C.      AASHTO M 140: Emulsified Asphalt
- D.      AASHTO M 208: Cationic Emulsified Asphalt
- E.      AASHTO M 226: Viscosity Graded Asphalt Cement



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- F. AASHTO M 320: Performance Graded Asphalt Cement
- G. AASHTO R 28: Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
- H. AASHTO T 44: Solubility of Bituminous Materials
- I. AASHTO T 48: Flash and Fire Points by Cleveland Open Cup
- J. ASHTO T 49: Penetration of Bituminous Materials
- K. AASHTO T 50: Float Test for Bituminous Materials
- L. AASHTO T 51: Ductility of Bituminous Materials
- M. AASHTO T 59: Testing Emulsified Asphalt
- N. AASHTO T 201: Kinematic Viscosity of Asphalts
- O. AASHTO T 228: Specific Gravity of Semi-Solid Bituminous Materials
- P. AASHTO T 240: Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)
- Q. AASHTO T 300: Force Ductility of Bituminous Materials
- R. AASHTO T 301: Elastic Recovery Test of Bituminous Materials by Means of a Ductilometer
- S. AASHTO T 313: Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
- T. AASHTO T 314: Determining the Fracture Properties of Asphalt Binder in Direct Tension
- U. AASHTO T 315: Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
- V. AASHTO T 316: Viscosity Determination of Asphalt Binder Using Rotational Viscometer
- W. ASTM D 92: Flash and Fire Points by Cleveland Open Cup
- I. ASTM D 1190: Concrete Joint Sealer, Hot-Applied Elastic Type

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- Y: ASTM D 2006: Method of Test for Characteristic Groups in Rubber Extender and Processing Oils by the Precipitation Method.
- Z. ASTM D 2007: Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method
- AA. ASTM D 2026: Cutback Asphalt (Slow-Curing Type)
- BB. ASTM D 3405: Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements
- CC. ASTM D 4402: Viscosity Determinations of Unfilled Asphalts Using the Brookfield Thermosel Apparatus
- DD. ASTM D 5329: Sealants and Fillers, Hot-Applied, For Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements
- EE. ASTM D 5801: Toughness and Tenacity of Bituminous Materials
- FF. California Test Methods
- GG. UDOT Materials Manual of Instruction
- HH. UDOT Minimum Sampling and Testing Guide

### **1.4 SUBMITTALS**

- A. For each shipment of material, supply a vendor-prepared bill of lading showing the following information:
  - 1. Type and grade of material
  - 2. Type and amount of additives, used, if applicable
  - 3. Destination
  - 4. Consignee's name
  - 5. Date of Shipment
  - 6. Railroad car or truck identification
  - 7. Project number
  - 8. Loading temperature
  - 9. Net weight in tons (or net gallons corrected to 60 degrees F, when requested)
  - 10. Specific gravity
  - 11. Bill of lading number
  - 12. Manufacturer of asphalt material

## **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Each shipment of asphalt material must:
  - 1. Be uniform in appearance and consistency.
  - 2. Show no foaming when heated to the specified loading temperature.
- B. Do not supply shipments contaminated with other asphalt types or grades than those specified.

## **1.6 GRADE OF MATERIAL**

- A. The Engineer determines the grade of material to be used based on the supply source designated by the Contractor when the bid proposal lists more than one grade of asphalt material.

## **PART 2 PRODUCTS**

### **2.1 PERFORMANCE GRADED ASPHALT BINDER (PGAB)**

- A. Supply PGABs under the Approved Supplier Certification (ASC) System. Refer to the UDOT Minimum Sampling and Testing Guide, Section 509, Asphalt Binder Management Plan.
- B. As specified in AASHTO M 320 for all PGABs having algebraic differences less than 92 degrees between the high and low design temperatures.
- C. As specified in Tables 1, 2, 3, 4, 5, 6, 7, and 8 for all PGABs having algebraic differences equal to or greater than 92 degrees between the high and low design temperatures.

**Table 1****PG58-34**

<b>Original Binder</b>		
Dynamic Shear Rheometer, AASHTO T 315	@58°C, G*, kPa	1.30 Min.
	@58°C, phase angle, degrees	74.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@58°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	65 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@16°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-24°C, S, MPa	300 Max.
	@-24°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-24°C, Failure Strain, %	1.5 Min.
	@-24°C, Failure Stress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 2****PG64-28**

<b>Original Binder</b>		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*, kPa	1.30 Min.
	@64°C, phase angle, degrees	74.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	65 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@ 22°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-18°C, S, MPa	300 Max.
	@-18°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-18°C, Failure Strain, %	1.5 Min.
	@-18°C, Failure Stress (b), Mpa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 3****PG64-34**

<b>Original Binder</b>		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*, kPa	1.30 Min.
	@64°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T-240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	70 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@19°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-24°C, S, MPa	300 Max.
	@-24°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-24°C, Failure Strain, %	1.5 Min.
	@-24°C, FailureStress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 4****PG70-22**

<b>Original Binder</b>		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*, kPa	1.30 Min.
	@70°C, phase angle, degrees	74.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	65 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@28°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-12°C, S, MPa	300 Max.
	@-12°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-12°C, Failure Strain, %	1.5 Min.
	@-12°C, FailureStress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 5****PG70-28****Original Binder**

Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*, kPa	1.30 Min.
	@70°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	70 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@25°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-18°C, S, MPa	300 Max.
	@-18°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-18°C, Failure Strain, %	1.5 Min.
	@-18°C, FailureStress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 6****PG70-34****Original Binder**

Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*, kPa	1.30 Min.
	@70°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135 °C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	75 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@22°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-24°C, S, MPa	300 Max.
	@-24°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-24°C, Failure Strain, %	1.5 Min.
	@-24°C, FailureStress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 7****PG76-22**

<b>Original Binder</b>		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*, kPa	1.30 Min.
	@76°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	70 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@ 31°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-12°C, S, MPa	300 Max.
	@-12°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-12°C, Failure Strain, %	1.5 Min.
	@-12°C, FailureStress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

**Table 8****PG76-28**

<b>Original Binder</b>		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*, kPa	1.30 Min.
	@76°C, phase angle, degrees	71. 0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
<b>RTFO Residue, AASHTO T 240</b>		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod (a)	%	75 Min.
<b>PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28</b>		
Dynamic Shear Rheometer, AASHTO T 315	@28°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-18°C, S, MPa	300 Max.
	@-18°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-18°C, Failure Strain, %	1.5 Min.
	@-18°C, FailureStress (b), MPa	4.0 Min.
(a) Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor...		
(b) No allowances will be given for passing at a colder grade		

## 2.2 ASPHALTIC CEMENT, LIQUID ASPHALTS, REJUVENATING AGENTS

A. As specified in AASHTO M 226, Table 2 with the following modifications:

1. Delete and replace ductility at 77EF (25EC) with ductility at 39.2EF (4EC) with values as detailed below.

AC - 2.5  
50+

AC - 5  
25+

AC - 10  
15+

AC - 20  
5+

B. As specified for cationic and anionic emulsified asphalt.

1. All standard Slow Setting (SS, CSS), Medium Setting (MS, CMS), and Rapid Setting (RS, CRS) grades; inclusive of all High-Float designations (HF).
2. Supply under the Approved Supplier Certification System (ASC).
3. Meet AASHTO M 208 and M 140.

C. Conform to the requirements of one of these tables:

1. Table 9: Cationic Rapid Setting Emulsified Polymerized Asphalt (CRS-2P)
2. Table 10: Latex Modified Cationic Rapid Setting Emulsified Asphalt (LMCRS-2)
3. Table 11: Cationic Medium Setting Emulsified Asphalt (CMS-2S)
4. Table 12: High Float Medium Setting Emulsified Asphalt (HFMS-2)
5. Table 13: High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2P)
6. Table 14: High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2SP)
1. Table 15: High Float Rapid Setting Emulsified Polymerized Asphalt (HFRS-2P).
8. Table 16: Setting Cationic Rapid Emulsified Asphalt (CRS-2A, B)

D. Curing cut-back asphalt:

1. As specified for slow curing (SC) in ASTM D 2026.
2. As specified for medium curing (MC) in AASHTO M 82.
3. As specified for rapid curing (RC) in AASHTO M 81.

E. Conform to requirements for Emulsified Asphalt Pavement Rejuvenating Agent:

1. Table 17: Type A
2. Table 18: Type B
3. Table 19: Type B Modified
1. Table 20: Type C
5. Table 21: Type D



Table 9

<b>Cationic Rapid Setting Emulsified Polymerized Asphalt (CRS-2P)</b>			
<b>Tests</b>	<b>AASHTO Test Method</b>	<b>Min.</b>	<b>Max.</b>
<b>Emulsion</b>			
Viscosity , SF, 140EF (60EC), s (Project-site Acceptance/Rejection Limits)	T 59	100	400
Settlement (a) 5 days, percent	T 59		5
Storage Stability Test (b) 1 d, 24 h, percent	T 59		
Demulsibility (c) 35 ml, 0.8% sodium dioctyl Sulfosuccinate, percent	T 59	40	
Particle Charge Test	T 59	Positive	
Sieve Test, percent	T 59		0.10
<b>Distillation</b>			
Oil distillate, by volume of emulsion, percent			0
Residue (d), percent		68	
<b>Residue from Distillation Test</b>			
Penetration, 77EF(25EC), 100 g, 5 s, dmm	T 49	80	150
Ductility, 39.2EF(4EC), 5 cm/min, cm	T 51	35	
Toughness, lb-in	ASTM D 5801	75	
Tenacity, lb-in	ASTM D 5801	50	
Solubility in trichloroethylene, percent	T 44	97.5	
<p>(a) The test requirement for settlement may be waived when the emulsified asphalt is used in less than a five-day time; or the purchaser may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.</p> <p>(b) The 24-hour (1-day) storage stability test may be used instead of the five-day settlement test.</p> <p>(c) The demulsibility test is made within 30 days from date of shipment.</p> <p>(d) Distillation is determined by AASHTO T 59, with modifications to include a <math>350 \pm 5</math> EF (<math>177 \pm 3^\circ\text{C}</math>) maximum temperature to be held for 15 minutes.</p>			
Modify the asphalt cement prior to emulsification.			

**Table 10**

<b>Latex Modified Cationic Rapid Setting Emulsified Asphalt (LMCRS-2)</b>			
<b>Tests</b>	<b>AASHTO Test Method</b>	<b>Min.</b>	<b>Max.</b>
<b>Emulsion</b>			
Viscosity, SF, 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	140	400
Settlement (a) 5 days, percent	T 59		5
Storage Stability Test (b) 1 d, 24 h, percent	T 59		1
Demulsibility (c) 35 ml, 0.8% sodium dioctyl Sulfosuccinate, percent	T 59	40	
Particle Charge Test	T 59	Positive	
Sieve Test, percent	T 59		0.3
<b>Distillation</b>			
Oil distillate, by volume of emulsion, percent			0
Residue (d), percent		65	
<b>Residue from Distillation Test</b>			
Penetration, 77EF (25EC), 100 g, 5 s, dmm	T 49	40	200
Torsional Recovery (e)		18	
<p>(a) The test requirement for settlement may be waived when the emulsified asphalt is used in less than a five-day time; or the purchaser may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.</p> <p>(b) May use the 24-hour (1-day) storage stability test instead of the five-day settlement test.</p> <p>(c) Make the demulsibility test within 30 days from date of shipment.</p> <p>(d) Determine distillation by AASHTO T 59, with modifications to include a <math>350 \pm 5</math> EF (<math>177 \pm 3</math> EC) maximum temperature to be held for 15 minutes.</p> <p>(e) CA 332 (California Test Method)</p>			
<b>Co-mill latex and asphalt during emulsification</b>			

**Table 11**

<b>Cationic Medium Setting Emulsified Asphalt (CMS-2S)</b>		
<b>Tests</b>	<b>AASHTO Test Method</b>	<b>Specification</b>
<b>Emulsion</b>		
Viscosity, SF, 122EF (50EC), s	T 59	50 - 450
Percent residue	T 59	60 min
Storage Stability Test, 1d, 24h, percent	T 59	1 max
Sieve, percent	T 59	0.10 max
Particle charge	T 59	Positive
Oil Distillate, percent by volume of emulsion	T 59	5-15
<b>Residue</b>		
Penetration, 77EF (25EC), 100g, 5 sec, dmm	T 59	100-250
Solubility, percent	T 59	97.5 min.

**Table 12**

<b>High Float Medium Setting Emulsified Asphalt ( HFMS-2)</b>			
<b>Tests</b>	<b>AASHTO Test Method</b>	<b>Min.</b>	<b>Max.</b>
<b>Emulsion</b>			
Viscosity, SF, 122°F (50°C), s (Project Site Acceptance/Rejection Limits)	T59	70	300
Storage Stability Test, 1d, 24 h, percent	T59		1.0
Sieve Test , percent	T59		0.1
<b>Distillation</b>			
Oil Distillate, by volume of emulsion, percent	T59	NA	NA
Residue, percent	T59	65	
<b>Residue from Distillation Test</b>			
Penetration, 77°F (25°C), 100g, 5 s, dmm	T49	50	200
Float Test, 140°F (60°C), s	T50	1200	
Solubility in Trichloroethylene, percent	T44	97.5	
Ductility, 77°F (25°C) 5cm/min, cm	T51	40	

**Table 13**

<b>High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2P) (a)</b>			
<b>Tests</b>	<b>AASHTO Test method</b>	<b>Min.</b>	<b>Max.</b>
<b>Emulsion</b>			
Viscosity, SF, 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	100	450
Storage Stability Test, 1 d, 24 h, percent	T 59		1.0
Sieve Test, percent	T 59		0.1
<b>Distillation</b>			
Oil distillate, by volume of emulsion, percent	T 59		7
Residue (b), percent	T 59	65	
<b>Residue from Distillation Test</b>			
Penetration, 77EF (25EC), 100 g, 5 s, dmm	T 49	70	300
Float Test, 140EF (60EC), s	T 50	1200	300
Solubility in trichloroethylene, percent	T 44	97.5	
Elastic Recovery, 77EF (25EC), percent	T 301	50	
<p>(a) Supply an HFMS-2P (anionic, polymerized, high-float) as an emulsified blend of polymerized asphalt cement, water, and emulsifiers. Polymerize the asphalt cement with a minimum of 3.0% polymer by weight of the asphalt cement prior to emulsification. After standing undisturbed for a minimum of 24 hours, the emulsion shall be smooth and homogeneous throughout with no white, milky separation, pumpable, and suitable for application through a distributor.</p> <p>(b) Determine the distillation by AASHTO T 59, with modifications to include a <math>350 \pm 5</math> EF (<math>177 \pm 3</math> EC) maximum temperature to be held for 15 minutes.</p>			

**Table 14**

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<b>High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2SP) (a)</b>			
<b>Tests</b>	<b>AASHTO Test method</b>	<b>Min.</b>	<b>Max.</b>
<b>Emulsion</b>			
Viscosity, SF, 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	50	450
Storage Stability Test, 1 d, 24 h, percent	T 59		1
Sieve Test, percent	T 59		0.1
<b>Distillation</b>			
Oil distillate, by volume of emulsion, percent	T 59		7
Residue (b), percent	T 59	65	
<b>Residue from Distillation Test</b>			
Penetration, 77EF (25EC), 100 g, 5 s, dmm	T 49	150	300(c)
Float Test, 140EF (60EC), s	T 50	1200	
Solubility in trichloroethylene, percent	T 44	97.5	
Elastic Recovery(d), 77EF (25EC), percent	T 301	50	
<p>(a) Supply an HFMS-2SP (anionic, polymerized, high-float) as an emulsified blend of polymerized asphalt cement, water, and emulsifiers. Polymerize the asphalt cement with a minimum of 3.0% polymer by weight of the asphalt cement prior to emulsification. After standing undisturbed for a minimum of 24 hours, the emulsion shall be smooth and homogeneous throughout with no white, milky separation, pumpable, and suitable for application through a distributor.</p> <p>(b) Determine the distillation by AASHTO T 59, with modifications to include a 350± 5EF (177±3EC) maximum temperature to be held for 15 minutes.</p> <p>(c) When approved by the Engineer, Emulsified Asphalt (HFMS-2SP) with a residual penetration greater than 300 dmm may be used with Cold Bituminous Pavement (Recycle) to address problems with cool weather or extremely aged existing pavement.</p> <p>(d) Report only when penetration is greater than 300 dmm.</p>			

**Table 15**

<b>High Float Rapid Setting Emulsified Polymerized Asphalt (HFRS-2P) (a)</b>			
<b>Tests</b>	<b>AASHTO Test method</b>	<b>Min.</b>	<b>Max.</b>
<b>Emulsion</b>			
Viscosity, SF @ 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	50	450
Storage Stability Test (b) 1 d, 24 h, percent	T 59		1
Demulsibility 0.02 N Ca Cl <sub>2</sub> , percent	T 59	40	
Sieve Test, percent	T 59		0.1
<b>Distillation</b>			
Oil distillate, by volume of emulsion, percent	T 59		3
Residue (b), percent	T 59	65	
<b>Residue from Distillation Test</b>			
Penetration, 77°F (25EC), 100 g, 5 s, dmm	T 49	70	150
Float Test, 140EF (60EC), s	T 50	1200	
Solubility in trichloroethylene, percent	T 44	97.5	
Elastic Recovery, 77EF (25EC), percent	T 301	58	
<p>(a) Supply an HFMS-2SP (anionic, polymerized, high-float) as an emulsified blend of polymerized asphalt cement, water, and emulsifiers. Polymerize the asphalt cement with a minimum of 3.0% polymer by weight of the asphalt cement prior to emulsification. After standing undisturbed for a minimum of 24 hours, the emulsion shall be smooth and homogeneous throughout with no white, milky separation, pumpable, and suitable for application through a distributor.</p> <p>(b) Determine the distillation by AASHTO T 59, with modifications to include a <math>350 \pm 5\text{EF}</math> (<math>177 \pm 3\text{EC}</math>) maximum temperature to be held for 15 minutes.</p>			

**Table 16**

<b>Cationic Rapid Setting Emulsified Asphalt (CRS-2A,B)</b>			
<b>Tests</b>	<b>AASHTO Test Method</b>	<b>Min</b>	<b>Max</b>
<b>Emulsion</b>			
Viscosity, SF, 122EF (50EC), s (Project Site Rejection/Acceptance Limits)	T 59	140	400
Storage stability test, 24 h, percent	T 59		1
Demulsibility, 35 mL 0.8 percent Sodium Dioctyl Sulfosuccinate, percent	T 59	40	
Particle charge test	T 59	Positive	
Sieve test, percent	T 59		0.10
<b>Distillation</b>			
Oil distillate, by volume of emulsion, percent	T 59		0
Residue, percent	T 59	65	
Use PG58-22 and PG64-22 as base asphalt cement for CRS-2A, B, respectively. Specification for high temperature performance: original and RTFO G*/sin* within 3EC of grade.			

**Table 17**

<b>Emulsified Type A Asphalt Pavement Rejuvenating Agent Concentrate</b>		
<b>Property</b>	<b>Test Method</b>	<b>Limits</b>
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	15 Min 40 Max
Residue , percent W (a)	AASHTO T 59	60 Min. 65 Max.
Miscibility Test (b)	AASHTO T-59	No Coagulation
Sieve Test, percent W ( c)	AASHTO T 59	0.20 Max.
5-day Settlement, percent W	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
Light Transmittance , %	UDOT MOI 8-973	30 Max.
Cement Mixing	AASHTO T-59	2 Max.
<b>Residue from Distillation (a)</b>		
Viscosity, 140 °F (60EC), mm <sup>2</sup> /s	ASTM D 4402	150 - 300
Flash Point, COC, EF (EC)	AASHTO T 48	385 Min.
Asphaltenes, percent W	ASTM D 2006-70	0.4 Min. 0.75 Max.
Maltene Distribution Ratio (PC + A <sub>1</sub> )/(S + A <sub>2</sub> ) (d)	ASTM D 2006-70	0.3 Min. 0.6 Max
Saturated Hydrocarbons, S (d)	ASTM D 2006-70	21 Min. 28 Max.
PC/S Ratio (d)	ASTM D 2006-70	1.5 Min.
(a) AASHTO T 59 , Evaporation Test, modified as follows: Heat a 50 gram sample to 300 °F until foaming ceases, then cool immediately and calculate results. (b) AASHTO T 59, modified as follows: use a 0.02 Normal Calcium Chloride solution in place of distilled water. (c) AASHTO T 59, modified as follows: use distilled water in place of a two percent sodium oleate solution. (d) Chemical composition by ASTM Method D-2006-70: PC= Polar Compounds,   A <sub>1</sub> = First Acidaffins A <sub>2</sub> = Second Acidaffins,   S = Saturated Hydrocarbons		



**Table 18**

<b>Emulsified Type B Asphalt Pavement Rejuvenating Agent Concentrate</b>		
<b>Tests</b>	<b>Test Method</b>	<b>Limits</b>
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	25-150
Residue, percent W	AASHTO T 59 (mod) (a)	62 Min.
Sieve Test, percent W	AASHTO T 59	0.10 Max.
5-day Settlement	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
Pumping Stability (b)		Pass
<b>Residue from Distillation (a)</b>		
Viscosity @ 140°F (60°C), mm <sup>2</sup> /s	AASHTO T 201	2500-7500
Solubility in 1,1,1 Trichloroethylene, percent	AASHTO T 44	98 Min.
Flash Point, COC	ASTM D 92	204EC, Min.
Asphaltenes, percent W	ASTM D 2007	15 Max.
Saturates, percent W	ASTM D 2007	30 Max.
Aromatics, percent W	ASTM D 2007	25 Min.
Polar Compounds, percent W	ASTM D 2007	25 Min.
(g) Determine the distillation by AASHTO T 59 with modifications to include a 300 ±5EF (149±3EC) maximum temperature to be held for 15 minutes.		
(b) Test pumping stability by pumping 475 ml of Type B diluted 1 part concentrate to 1 part water, at 77EF (25°C) through a 1/4 inch gear pump operating at 1750 rpm for 10 minutes with no significant separation or coagulation in pumped material.		
Type B: an emulsified blend of, lube oil and/or lube oil extract, and petroleum asphalt.		

**Table 19**

<b>Emulsified Type B Modified Asphalt Pavement Rejuvenating Agent Concentrate</b>		
<b>Property</b>	<b>Test Method</b>	<b>Limits</b>
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	50-200
Residue(a), percent W	AASHTO T 59	62 Min.
Sieve Test, percent W	AASHTO T 59	0.20 Max.
5-day Settlement, percent W	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
Pumping Stability (b)		Pass
<b>Residue from Distillation (a)</b>		
Viscosity (c) 275EF (135EC), cP	ASTM D 4402	150 - 300
Penetration, 77EF (25EC), dmm	AASHTO T 49	180 Min.
Solubility in 1,1,1 Trichloroethylene, percent	AASHTO T 44	98 Min.
Flash Point, COC, EF (EC)	AASHTO T 48	400(204) Min.
Asphaltenes, percent W	ASTM D 2007	20-40
Saturates, percent % W	ASTM D 2007	20 Max.
Polar Compounds, percent W	ASTM D 2007	25 Min.
Aromatics, percent W	ASTM D 2007	20 Min.
PC/S Ratio	ASTM D 2007	1.5 Min.
(a) Determine the distillation by AASHTO T 59 with modifications to include a 300±5EF (149±3°C) maximum temperature to be held for 15 minutes. (b) Pumping stability is tested by pumping 475 ml of Type B diluted 1 part concentrate to 1 part water, at 77EF (25EC) through a 1/4 inch gear pump operating at 1750 rpm for 10 minutes with no significant separation or coagulation in pumped material. (c) Brookfield Thermocel Apparatus-LV model. ≥ 50 rpm with a #21 spindle, 7.1 g residue, at > 10 torque		
As required by the Asphalt Emulsion Quality Management Plan, UDOT Minimum Sampling and Testing Guide, Section 508) the supplier certifies that the base stock contains a minimum of 15% by weight of Gilsonite Ore. Use the HCL precipitation method as a qualitative test to detect the presence of Gilsonite.		

**Table 20**

<b>Emulsified Type C Asphalt Pavement Rejuvenating Agent Concentrate</b>		
<b>Property</b>	<b>Test Method</b>	<b>Limits</b>
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	10-100
Residue (a), percent W (Type C supplied ready to use 1:1 or 2:1.	AASHTO T 59	30 Min. 1:1 40 Min. 2:1
Sieve Test, percent W (b)		0.10 Max.
5-day Settlement, percent W	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
pH (May be used if particle charge test is inconclusive)		2.0 - 7.0
Pumping Stability (c)		Pass
<b>Tests of Residue from Distillation (a)</b>		
Viscosity, 275EF (135°C), mm <sup>2</sup> /s	AASHTO T 201	475-1500
Solubility in 1,1,1 Trichloroethylene, percent	AASHTO T 44	97.5 Min.
RTFO mass loss, percent W	AASHTO T 240	2.5 Max.
Specific Gravity	AASHTO T 228	0.98 Min.
Flash Point, COC	AASHTO T 48	232 EC, Min.
Asphaltenes, percent W	ASTM D 2007	25 Min., 45 Max.
Saturates, percent W	ASTM D 2007	10 Max.
Polar Compounds, percent W	ASTM D 2007	30 Min.
Aromatics, percent W	ASTM D 2007	15 Min.
(a) Determine the distillation by AASHTO T 59 with modifications to include a 300± 5EF (149 ± 3EC) maximum temperature to be held for 15 minutes. (b) Test method identical to AASHTO T 59 except that distilled water is used in place of 2 % sodium oleate solution. (c) Test pumping stability by pumping 475 ml of Type diluted 1 part concentrate to 1 part water, at 77EF (25EC) through a 1/4 inch gear pump operating at 1750 rpm for 10 minutes with no significant separation or coagulation in pumped material.		
As required by the Asphalt Emulsion Quality Management Plan, UDOT Minimum Sampling and Testing Guide, Section 508), the supplier certifies that the base stock contains a minimum of 10% by weight of Gilsonite ore. Use the HCL precipitation method as a qualitative test to detect the presence of Gilsonite.		

**Table 21**

<b>Emulsified Type D Asphalt Pavement Rejuvenating Agent Concentrate</b>		
<b>Property</b>	<b>Test Method</b>	<b>Limits</b>
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	30-90
Residue, (b) percent W	AASHTO T 59	65
Sieve Test, percent W	AASHTO T 59	0.10 Max.
pH		2.0 - 5.0
<b>Residue from Distillation (b)</b>		
Viscosity, 140EF (60EC), cm <sup>2</sup> /s	AASHTO T 201	300-1200
Viscosity, 275EF (135EC), mm <sup>2</sup> /s	AASHTO T 201	300 Min.
Modified Torsional Recovery (a) percent	CA 332 (Mod)	40 Min.
Toughness, 77EF (25EC), in-lb	ASTM D 5801	8 Min.
Tenacity, 77EF (25EC), in-lb	ASTM D 5801	5.3 Min.
Asphaltenes, percent W	ASTM D 2007	16 Max.
Saturates, percent W	ASTM D 2007	20 Max.
(a) Torsional recovery measurement to include first 30 seconds.		
(b) Determine the distillation by AASHTO T 59 with modifications to include a 300±5EF (149±3EC) maximum temperature to be held for 15 minutes.		

## **2.3 HOT-POUR CRACK SEALANT FOR BITUMINOUS CONCRETE**

- A. Combine a homogenous blend of materials to produce a sealant meeting properties and tests in Table 22.
- B. Packaging and Marking: Supply sealant pre-blended, pre-reacted, and pre-packaged in lined boxes weighing no more than 30 lb.
  - 1. Use a dissolvable lining that will completely melt and become part of the sealant upon subsequent re-melting.
  - 2. Deliver the sealant in the manufacturer's original sealed container. Clearly mark each container with the manufacturer's name, trade name of sealant, batch or lot number, and recommended safe heating and application temperatures.

**Table 22**

<b>Hot-Pour Bituminous Concrete Crack Sealant</b>			
<b>Application Properties:</b>			
Workability:	Pour readily and penetrate 0.25 inch and wider cracks for the entire application temperature range recommended by the manufacturer.		
Curing:	No tracking caused by normal traffic after 45 minutes from application.		
Asphalt Compatibility: ASTM D 5329, Section 14.	No failure in adhesion. No formation of an oily ooze at the interface between the sealant and the bituminous concrete or softening or other harmful effects on the bituminous concrete.		
Material Handling:	Follow the manufacturer's safe heating and application temperatures.		
<b>Test Method</b>	<b>Property</b>	<b>Minimum</b>	<b>Maximum</b>
AASHTO T 51	Ductility, modified, 1cm/min, 39.2EF (4EC), cm	30	
UDOT method 967	Cold Temperature Flexibility	no cracks	
AASHTO T 300 (a)	Force-Ductility, lb force		4
ASTM D 5329	Flow 140EF (60EC), 5 hrs 75Eangle, mm		3
ASTM D 3405 (b)	Tensile-Adhesion, modified	300%	
AASHTO T 228	Specific Gravity, 60EF (15.6EC)		1.140
ASTM D 5329	Cone Penetration, 77EF (25EC), 150 g, 5 sec., dmm		90
ASTM D 5329	Resilience, 77EF (25EC), 20 sec., percent	30	
ASTM D 4402	Viscosity, 380EF (193.3EC), SC4-27 spindle, 20 rpm, cP		2500
ASTM D 5329	Bond as per ASTM D 1190, Section 6.4		Pass
(a)	Maximum of 4 lb force during the specified elongation of 30 cm @ 1 cm/min, 39.2EF (4EC).		
(b)	Use ASTM D 3405, Section 6.4.1. Delete bond and substitute tensile-adhesion test in accordance to D 5329.		

**PART 3      EXECUTION      Not used**

END OF SECTION

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02765S**

**PAVEMENT MARKING PAINT**

**Delete Section 02765 in its entirety and replace with the following:**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      Furnish Acrylic Water Based pavement marking paint meeting Federal Specification TTP-1952 D and refer to 2.2 for resin requirement.
- B.      Apply to hot mix asphalt or Portland cement as edge lines, center lines, broken lines, guidelines, contrast lines, symbols and other related markings.
- C.      Remove pavement markings.

**1.2      REFERENCES**

- A.      AASHTO M 247: Glass Beads Used in Traffic Paint
- B.      ASTM D 562: Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using the Stormer-Type Viscometer
- C.      ASTM D 2205: Selection of Tests for Traffic Paints
- D.      ASTM D 2743: Uniformity of Traffic Paint Vehicle Solids by Spectroscopy and Gas Chromatography
- E.      ASTM D 2805: Hiding Power of Paints by Reflectometry
- F.      ASTM D 3723: Pigment Content of Water-Emulsion Paints
- G.      ASTM D 3960: Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
- H.      ASTM D 4451: Pigment Content of Paints

- I. ASTM D 5381: X-Ray Fluorescence (XRF) Spectroscopy of Pigments and Extenders
- J. ASTM E 1347: Standard Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry
- K. Federal Standards

### **1.3 ACCEPTANCE**

- A. Provide fixtures (ball valves, gate valves or other) on paint truck for the purposes of obtaining field samples.
- B. Agitate the paint to allow for thorough mixing. Follow paint manufacturer's recommendation for agitation and mixing times.
- C. Stop all agitation before sample is drawn.
- D. All meters on the paint truck must be calibrated annually and certified for application rate verification. Calibration tolerances for meters must be +/- 0.5 pounds per gallon. Keep a clean, legible copy of calibration report with the paint truck. Certifications performed by company personnel, meter calibration companies or UDOT Equipment Certification Unit.
- E. UDOT ENGINEER:
  - 1. Visually inspects each line to verify bead adhesion and compliance with specified line dimensions requirements.
  - 2. Verifies that the paint and beads are being applied within specified tolerances a minimum of once each production day.
  - 3. Verifies quantities used by either method:
    - a. Measuring both paint and bead tanks prior to and after application.
    - b. Witnessing the meter readings prior to and after application.
  - 4. Randomly sample each color of pavement marking paint used, minimum of one sample each per project.
    - a. Use a clean one-pint metal paint can.
    - b. Sample paint immediately after the paint has been completely agitated. (Stop all agitation before drawing the sample)
    - c. Allow a minimum of 10 gallons to be applied prior to taking sample.
    - d. Fill the sample container to within ½ inch of full.
    - e. Seal the containers immediately by tightly attaching the container's lid.
    - f. Submit paint samples to Central Chemistry Lab for acceptance.

- g. For each sample include:
- Project Number
  - Project Name
  - Paint Manufacturer
  - Batch Number
  - Striping Company
  - Color of Paint
  - Est. Quantity
  - Date Sampled
  - Sampler=s name

- F. Repaint any line or symbol failing to meet bead adherence and dimensional requirements.
- A. Price Reductions for Pavement Markings installed below the specified wet mil thickness are outlined in Table I.

<b>Table I - Price Reduction for Wet Mil Thickness</b>	
	Pay Factor
At the specified mil thickness	1.00
1-10 percent below the Specified wet mil thickness	0.75
11-15 percent below the Specified wet mil thickness	0.50
More than 15 percent below the Specified wet mil thickness	Repaint Pavement Markings

- H. Price reductions for pavement markings that fail to meet the requirements of Table III are outlined in Table II. When more than one of the requirements of Table III are deficient. The result with the highest price reduction governs.

<b>Table II - Price Reductions</b>	
	Pay Factor
At the specified requirements	1.00
Up to 1 percent deficient	0.90
Up to 2 percent deficient	0.80
Up to 3 percent deficient	0.70
Up to 4 percent deficient	0.60
Up to 5 percent deficient	0.50
More than 5 percent below specified quantitative requirements	Repaint Pavement Markings



## PART 2 PRODUCTS

### 2.1 Manufacturers

- A. Select an acrylic water based pavement marking paint manufacturer, from the Accepted Products Listing (APL) maintained by the UDOT Research Division.

### 2.2 Paint

- A. Follow Federal Standards 595B, 37875, 33538, and 11105. Meet the following requirements for Acrylic Water Based Paint as listed in Table III:

Table III - Paint Requirements				
Property	White	Yellow (lead free)	Black	Test
Pigment: Percent by weight	62.0	62.0	62.0	ASTM D 3723
Total Solids: Percent by weight, minimum	77.0	77.0	77.0	ASTM D 2205
Nonvolatile vehicle: Percent by weight vehicle, minimum*	40.0	40.0	40.0	ASTM D 2205
Viscosity, KU @ 77 degrees F	80 – 95	80 - 95	80 - 95	ASTM D 562
Volatile Organic Content (VOC): lbs/gal, maximum	1.25	1.25	1.25	ASTM D 3960
Titanium Dioxide Content, lbs/gal	1.0 min	0.2 max	N/A	ASTM D 5381
Directional Reflectance : Minimum	92.0	50.0	N/A	ASTM E 1347
Dry Opacity: Minimum (5 mils wet)	0.95	0.95	N/A	ASTM D 2805

\* The binder shall be 100 percent acrylic, a minimum of 40 percent, by weight, as determined by infrared analysis and other chemical analysis available to UDOT (ASTM D 2205). Consisting of either Rohm and Haas Fastrack HD- 21A or Dow DT-400NA.

- B. Additional requirements:

1. Free of lead, chromium, or other related heavy metals ASTM D 5381.
2. ASTM D 2743, ASTM D 4451 and ASTM D 5381: Tests used to verify paint samples meet Accepted Products Listing.

## **2.3 GLASS SPHERE (BEADS) USED IN PAVEMENT MARKING PAINT**

- A. Specific Properties: Meet AASHTO M 247 with the following exceptions.
  1. Gradation:

Passing a No. 14 sieve, percent	95 - 100
Passing a No. 16 sieve, percent	80 - 95
Passing a No. 18 sieve, percent	10 - 40
Passing a No. 20 sieve, percent	0 - 5
Passing a No. 25 sieve, percent	0 - 2
  2. Beads having a Silane adhesion coating.
  3. Roundness - The glass beads will have a minimum of 80 percent true spheres.
- B. Beads used in Temporary Pavement Markings meet AASHTO M 247 Type II uniform gradation.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Line Control.
  1. Establish control points at 100 ft intervals on tangent and at 50 ft intervals on curves.
  2. Maintain the line within 2 inches of the established control points and mark the roadway between control points as needed.
    - a. Remove paint that is not placed within tolerance of the established control points and replace at no expense to the Department. Refer to article 3.4.
    - b. Maintain the line dimension within 10 percent of the width and length dimensions defined in Standard Drawings.
- B. Remove dirt, loose aggregate and other foreign material and follow manufacturer's recommendations for surface preparation.

### 3.2 APPLICATION

- A. Apply Pavement marking paint at the following Wet mil thickness requirements.
1. 20 – 25 wet mils for all markings.

**Example Calculation:** (Verify wet mil thickness)

$$\text{Wet Mils} = \frac{(0.133681 \text{ ft}^3/\text{gal}) * 12000 \text{ mil/ft}}{(X \text{ ft/gal})(Z \text{ ft})}$$

Where,

X = application rate. (Meter readings or dipping tanks).

Z = line width measured in feet.

12000 = conversion from ft to mil

0.133681 = conversion from gallons to cubic feet.

**For information only:** Approximate application rate for required mil thickness requirements.

1. 4 inch Solid Line: From 190 to 240 ft/gal
  2. 4 inch Broken Line: From 760 to 960 ft/gal
  3. 8 inch Solid Line: From 95 to 120 ft/gal
- B. Refer to Table I for pavement markings that are less than 20 wet mils in thickness.
- C. No additional payment for pavement markings placed in excess of 25 wet mils in thickness or exceeding dimensional requirements outlined in Article 3.1 paragraph A.
- D. Painted Legends and Symbols 1 gallon per 80 square feet. Provide Engineer calculations of legends and symbols for pay determination.
- E. Glass Sphere (Beads): Apply a minimum of 8 lbs/gal of paint, the full length and width of line and pavement markings.
1. Do not apply glass beads to contrast lines (black paint).
- F. Begin striping operations no later than 24 hours after ordered by the Engineer.
- G. At time of application apply lines and pavement markings only when the air and pavement temperature are:
1. 50 degrees F and rising for Acrylic Water Based Paint.
- H. Comply with Traffic Control Drawings.

### **3.3 CONTRACTOR QUALITY CONTROL**

- A. Application Rate: Verify that the paint and beads are being applied within specified tolerances prior to striping.
- B. Curing: Protect the markings until dry or cured. In the event that the uncured marking is damaged the marking will be reapplied and track marks left on the pavement will be removed at no additional cost to the Department.

### **3.4 REMOVE PAVEMENT MARKINGS**

- A. Use one of these removal methods:
  - 1. Grinding
  - 2. High pressure water spray
  - 3. Sand blasting
  - 4. Shot blasting.
- B. Do not eliminate or obscure existing striping, in lieu of removal, by covering with black paint or any other covering material.
- C. Use equipment specifically designed for removal of pavement marking material

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02812S**

**WATER DISTRIBUTION SYSTEM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Pipe and fittings for project water lines, to include culinary water lines.
- B. Valves, Fire hydrants, and appurtenant items.

**1.02 RELATED SECTIONS**

- A. Section 02312S - Trenching for Pipe Work: Excavating, bedding, backfilling and compacting.
- B. Section 02315S - Excavation: Excavating for structures and appurtenant items.
- C. Section 02316S - Fill and Backfill: Bedding and backfilling.
- D. Section 02813S - Disinfection of Water Distribution Systems: Disinfection of site service utility water piping.
- E. Section 03300S - Cast-in-Place Concrete: Concrete for thrust restraints.

**1.03 REFERENCES**

- A. ASME B16.18 - Cast Bronze Solder Joint Pressure Fittings; The American Society of Mechanical Engineers.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; The American Society of Mechanical Engineers.
- C. ASTM B 88 - Standard Specification for Seamless Copper Water Tube.
- D. ASTM D 3139 - Standard Specification for Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.

## Federal Projects With Full Size Plan Sheets

- E. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society.
- F. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water; American Water Works Association; (ANSI/AWWA C104/A21.4).
- G. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; American Water Works Association; (ANSI/AWWA C105/A21.5).
- H. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; (ANSI/AWWA C111/A21.11).
- I. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; (ANSI/AWWA C151/A21.51).
- J. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service; American Water Works Association.
- K. AWWA C502 - Dry Barrel Fire Hydrants; American Water Works Association; (ANSI/AWWA C502/C502a).
- L. AWWA C504 - Rubber Seated Butterfly Valves; American Water Works Association.
- M. AWWA C508 - Swing-Check Valves for Waterworks Service, 2 In. (50 mm) Through 24 In. (600 mm) NPS; American Water Works Association; (ANSI/AWWA C508/C508a).
- N. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; (ANSI/AWWA C509/C509a).
- O. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances; American Water Works Association; (ANSI/AWWA C600).
- P. ASTM D2774 - Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.
- Q. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution; American Water Works Association; (ANSI/AWWA C900/C900a).
- R. AWWA C200 - Steel Water Pipe, 6-inches and Larger.
- S. Use latest issue of the above reference standards as of the date of the project.

## **1.04 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Project Record Documents: Record actual locations of pipe lines, valves, connections, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

## **1.05 QUALITY ASSURANCE**

- A. Perform Work in accordance with Owner's requirements as described herein.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store valves in shipping containers with labeling in place.

# **PART 2 PRODUCTS**

## **2.01 WATER PIPE**

- A. Ductile Iron Pipe: AWWA C151:
  - 1. Fittings: Ductile iron, standard thickness.
  - 2. Joints: AWWA C111, push-on type with rubber gasket.
  - 3. Joints: AWWA C111, mechanical joint type with gasket, bolts, and nuts.
  - 4. Joints: AWWA C110, flange type with gasket, bolts, and nuts.
  - 5. Jackets: AWWA C105 polyethylene jacket.
- B. Copper Tubing: ASTM B 88, Type K, annealed:
  - 1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
  - 2. Joints: Compression connection or AWS A5.8, BCuP silver braze.
- C. PVC Pipe: AWWA C900 Class 150 or 200, as indicated:
  - 1. Fittings: AWWA C111, cast iron.
  - 2. Joints: ASTM D 3139 compression gasket ring.
- D. Trace Wire: Magnetic detectable conductor, clear plastic covering, imprinted with "Water " in large letters.

## 2.02 VALVES

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Gate Valves Up To 3 Inches:

1. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, IPS ends, and handwheel.
2. Product: Powell U.S. Bronze Gate Valves, or accepted equal.
3. Substitutions: See Section 01600S - Product Requirements.

C. Gate Valves 3 Inches and Over:

1. AWWA C500, iron body, bronze trim, non-rising stem with square nut, single wedge, mechanical joint or flanged ends as indicated, and cast iron valve box.
2. AWWA C509, iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, mechanical joint or flanged ends as indicated, and cast iron valve box.
3. Product: Mueller Gate Valve or Resilient Seat Gate Valve, with appropriate type Pacific States Cast Iron Valve Box, or accepted equal.

D. Swing Check Valves From 2 Inches to 24 Inches:

1. AWWA C508, iron body, bronze trim, 45 degree swing disc, renewable disc and seat, flanged ends.
2. Product: Mueller Swing-Type Check Valve, or accepted equal.

E. Butterfly Valves From 2 Inches to 24 Inches:

1. AWWA C504, iron body, bronze disc, resilient replacement seat, mechanical joint or flanged ends as indicated, manual worm gear operator, and cast iron valve box where required.
2. Underground manual operators shall be totally enclosed, factory grease packed and sealed, bronze worm gear operators with self-locking gearing; stops shall be provided to prevent over travel of valve disc.
3. Valve operator shall be geared to close valves slowly. Number of turns to close valve from full open position shall be: 32 for 10-inch and smaller valves, 52 for 12-inch thru 16-inch valves, and 76 for 18-inch thru 24-inch valves. Closing times for larger valves shall be accepted by the Engineer.
4. Product: Mueller "Lineseal III" Butterfly Valve with appropriate type Pacific States Cast Iron Valve Box, or accepted equal.

F. Corporation Stops: shall be type for connecting to copper or polyethylene pipe; Mueller No. H- 15000, or acceptable equal, for up to 2-inch service line.

## 2.03 HYDRANTS

A. Hydrants: AWWA C502, UL 246, dry barrel type.

1. Inside dimension: 7 inches minimum, with minimum 5 inches diameter valve seat



opening.

2. Minimum net water area of barrel not less than 190 percent of valve opening.
  3. 6 inch flanged inlet connection with accessories, gland bolts, and gaskets.
  4. Product: Mueller "Super Centurion 200" Fire Hydrants.
- B. Hydrant Extensions: Fabricate in multiples of 6 inches with rod and coupling to increase barrel length.
- C. Hose and Streamer Connection: Two hose nozzles, 2 1/2-inch size, one pumper nozzle, 4 1/2 inch size.
- D. Finish: Buried portion of hydrant shall be painted with two coats of CA50 coal tar enamel. Exposed portion shall be painted with Primer and two coats of enamel in acceptable red color.

## **2.04 BEDDING AND COVER MATERIALS**

- A. Bedding: As specified in Sections 02312S and 02316S.
- B. Backfill: As specified in Sections 02312S and 02316S.

## **2.05 ACCESSORIES**

- A. Service Clamps: shall be bronze, double-strap type; Mueller No. H-16134, or acceptable equal, for up to 2 inch service lines.
- B. Concrete for Thrust Restraints: Concrete type specified in Section 03300S.

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify that water main and main line tee size, location, and invert are as indicated.

## **3.02 PREPARATION**

- A. Cut pipe ends square, ream pipe ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or mechanical joints.

### **3.03 TRENCHING**

- A. See Section 02312S and Sections 02315S and 02316S for additional requirements.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Form and place concrete for pipe thrust restraints at each change of pipe direction. Place concrete to permit full access to pipe and pipe accessories. Provide required sq ft of thrust restraint bearing on subsoil as indicated on the drawings.
- D. Backfill around sides and to top of pipe with backfill material, tamp in place and compact, then complete backfilling.

### **3.04 INSTALLATION - PIPE**

- A. Maintain separation of water main from sewer piping in accordance with State code.
- B. Establish elevations of buried piping to ensure not less than four ft of cover over pipe; or as indicated on the drawings and as directed by the City Engineer.
- C. Install pipe to indicated elevation to within tolerance of one inches.
- D. Install ductile iron piping and fittings to AWWA C600.
- E. Install PVC pressure pipe and fittings to ASTM D2774.
- F. Install pipe lines to line and grade indicated.
- G. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- H. Install access fittings to permit disinfection of water system performed under Section 02813S.
- I. Install trace wire above top of PVC pipe; coordinate with Section 02312S.

### **3.05 INSTALLATION - VALVES AND HYDRANTS**

- A. Set valves on concrete block or other acceptable solid bearing.
- B. Center and plumb valve box over valve operating nut. Set box cover flush with finished grade.
- C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

- D. Set hydrants to grade, with nozzles at least 20 inches above ground.
- E. Locate hydrant control valve as indicated on the drawings and as directed by the Engineer.
- F. Provide a drainage pit 24 inches square by 12 inches deep filled with one inches washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.
- G. Paint hydrants in accordance with manufacturer's standards.

### **3.06 SERVICE CONNECTIONS**

- A. Provide water service as indicated with meter box, meter yoke, reduced pressure backflow preventer and water meter.

### **3.07 CONNECTIONS TO EXISTING WATER LINES**

- A. Connection to existing water lines shall be made where and as indicated on the drawings and as directed by the Engineer. The sizes of pipe, fittings, valves and appurtenant items required to make connection shall correspond to the sizes of existing pipe and of project pipe.
- B. Excavate to existing pipe line at point of connection; determine actual conditions of existing pipe and all fittings and appurtenant items required to make the connection; and have all materials needed on site prior to any shut down or cutting into existing pipe lines.
- C. Connection which involve cutting into existing pipe lines include: cutting and removing sections of existing pipe and fittings as required; cleaning and preparing ends of existing pipe as required for connection; furnishing and installing all new pipe, fittings and valves required to make the connection of project pipe to the existing pipe as indicated; and all appurtenant work required to complete the connection.
- D. Connection into existing pipe lines under pressure include: furnishing and installing mechanical joint tapping sleeve of the appropriate size on the existing pipe at point of connection; furnishing and installing tapping valve, with valve box, on sleeve; tapping existing pipe with acceptable type drilling machine and equipment, without interrupting flow in existing pipe line; and all appurtenant work required to complete the connection.
- E. Connection to existing pipe line shall be made at such times and within the time limits and according to the directions as agreed to between the Contractor and the Owner.
- F. Cut and plug existing pipe lines where indicated and as directed by the Engineer. Excavate as required to locate existing pipe lines to be abandoned in place; cut the existing pipe, as required; and install permanent plug in end of pipe to be abandoned.

### **3.08 RECONNECT EXISTING WATER SERVICE LINES**

- A. Reconnect existing water service lines where and as indicated on the drawings and as directed by the Engineer. The sizes of pipe, fittings, saddles, corporation stops, and appurtenant items required to make reconnections shall correspond to the sizes of existing service lines and of project pipe.
- B. Excavate as required to locate the existing service line; determine actual conditions of existing service line and all fitting and appurtenant items needed to make the reconnections; and have all materials needed on site prior to any shut down of existing service line.
- C. After project pipe line has been thoroughly tested, disinfected, and put into operation, dis-connect existing water service lines from the existing water line. Excavate as required to expose the existing service line; cut the existing service line and remove a section of the line as required and as directed; and remove the existing corporation stop from the existing pipe and install a permanent plug in the tap in the existing water line which is to be abandoned.
- D. Tap the project pipe line with the appropriate size tapping machine and install a double strap service saddle, with corporation stop, on the project pipe. New copper tubing shall be furnished and installed to make the connection from the end of the existing service line to the new corporation stop. The new copper tubing shall be connected to the end of the existing service line with the appropriate type coupling and to the new corporation stop. In all reconnections, at least five feet of new tubing shall be installed, as indicated. Insulating couplings or adapters shall be used to connect pipe of dissimilar material.
- E. After the existing water service line has been disconnected from the existing water line, the reconnection work shall be pursued diligently so that the service line is reconnected to the project water line and put back into service in the shortest possible time.

### **3.09 REMOVING EXISTING FIRE HYDRANTS**

- A. Existing fire hydrant installations shall be removed and delivered to the Owner as indicated and as directed by the Engineer.
- B. Excavate as required to locate the existing hydrant supply line and control valve; determine actual conditions of existing supply line and all fitting required to complete the removal; and have all material needed at the job site prior to any shut down or cutting into existing pipe.
- C. After project pipe line has been thoroughly tested, disinfected and put into operation, cut the existing hydrant supply line and remove a section of the existing pipe from the cut

the hydrant and install a plug in the end of the pipe to be abandoned.. Remove the existing hydrant, control valve and valve box and deliver the material to the Owner as directed.

- D. After the hydrant installation has been completely removed and the existing pipe plugged, backfill the excavation to match adjacent ground surfaces; and compact material as described herein.

### **3.10 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance with Specifications.
- B. Pressure test water piping to 1.25 times pipe line working pressure in psi.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

**END OF SECTION**

September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02812M**

**PRESSURIZED IRRIGATION SYSTEMS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Aboveground, underground and drip irrigation systems complete with heads, valves, controls, emitters and accessories.

**1.2 RELATED SECTIONS**

- A. Section 02936: Vegetation Establishment Period.

**1.3 REFERENCES**

- A. ASTM A 53: Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- B. ASTM B 88: Copper Pipe.
- C. ASTM B 687: Brass, Copper, and Chromium-Plated Pipe Nipples.
- D. ASTM D 1784: Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated poly (Vinyl Chloride) (CPVC) Compounds.
- E. ASTM D 1785: Poly(Vinyl Chloride) PVC Plastic Pipe, Schedules 40, 80, and 120.
- F. ASTM D 2466 and D 2464: Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings; Schedules 40 and 80.
- G. ASTM D 2564: Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
- H. ASTM D 2672: Joints for IPS PVC Pipe Using Solvent Cement.

- I. ASTM F 656: Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- J. ASSE 1013, 1015: Backflow Preventers, Pressure Reducers.
- K. NEC: National Electric Code. (Latest edition)
- L. Utah Plumbing Code: Section 1003.

#### **1.4 PERFORMANCE REQUIREMENTS**

- A. Sprinkler system design:
  - 1. Design to be completed and submitted by the Contractor to the Engineer and approved prior to any installation. All valves, pressure regulators and filters to be of the Hunter product line.
  - 2. Design must include a service connection with a meter box, locking angle valve, water meter and a backflow preventer, complete.
  - 3. Design must include a pvc main line from the meter box to the zone valves.
  - 4. Design must include the use of Hunters Wireless Valve System and a hand held wireless controller to be given to Riverdale City upon closing out the project.
  - 5. Design must include at a minimum 3 emitters for each tree and 2 emitters for each plant. The emitters must flow at a rate of 1 gph per emitter.
  - 6. A minimum of three zone valves will be required.
  - 7. System must be installed with quick coupler connections, so that the system can be drained by assistance of an air compressor.
- B. Location of sprinkler heads, valves, emitters and piping to be submitted/approved.
  - 1. Adjust as necessary to avoid existing plants and other obstructions.
  - 2. At no time should the number of heads, valves and emitters for example be less than that indicated in the performance requirements.
- C. Water Coverage:
  - 1. Head to head coverage in turf and other planting areas (100 percent).
  - 2. Do not increase or decrease the number of heads, emitters or size of pipe following the approval by the Engineer.
- D. PVC Pipe: Must be stamped with certified NFS.
- E. If work is to continue after November 1 or resume before April 15, drain the system at the end of each work day. Do not permit water to remain in pipe overnight.
- F. Verify and have marked the location of all utilities and underground obstructions.

## **1.5 DEFINITIONS**

- A. Mainline: The system of pipes that carry water from the Point of Connection (POC) to the valves.
- B. Lateral Lines: The system of pipes that carry water from the valves to the sprinkler heads and/or emitters.

## **1.6 SUBMITTALS**

- A. Sprinkler System Design, complete.
- B. Product Data: Manufacturer's technical data and installation instructions.
- C. Certificates of compliance to Engineer prior to installation.
- D. As-Built Drawings: Red-lined plan layout and details illustrating mainline and lateral lines location, size, and assembly. Include type and coverage of heads, type of valves, controllers, fittings and accessories.
- E. Operating and Maintenance Data:
  - 1. Instructions covering full operation, care, and maintenance of system (and controls) and manufacturers parts catalog. Include drain procedures, blow out features for example.
  - 2. Instruct maintenance personnel in proper adjustment of sprinkler heads and use of special tools for adjustments.
- F. Keys:
  - 1. Gate Valve Key.
  - 2. Stop and Waste Valve Key: AT@ handle, rigid steel, 5 ft long minimum, key end to fit the stop and waste valve nut.

## **PART 2 PRODUCTS**

### **2.1 PIPE AND FITTINGS**

- A. Mainline: Solvent welded schedule 40 PVC through 1-1/2 inch, then Class 200 PVC. ASTM D 1784 and ASTM D 1785.
- B. Lateral line: Solvent welded schedule 40 PVC through 1-1/2 inch, then Class 200 PVC. Meet ASTM 1784 and ASTM D 1785.
- C. Pipe Fittings: Solvent welded schedule 40 PVC. Meet ASTM D 2466.



- D. Valve Fittings: Solvent welded schedule 40 PVC. Meet ASTM D 2464.
- E. Risers: Threaded schedule 80 PVC. Meet ASTM D 2464.
- F. Copper Pipe: Type K as specified in ASTM B 88.
- G. Copper Fittings: Wrought or cast as specified in ASTM B 687.

## **2.2 VALVES**

- A. Drip Zone Control Valve to be used:
  - 1. Hunter model # PCZ-101, 1" control valve.
  - 2. Flow: 0.5 to 15 gpm (30 to 900 gph; 0.12 to 3.45 m<sup>3</sup>/hr, 1.9 to 57 l/min)
  - 3. Pressure: 15 to 120 psi (1.0 to 8.0 bar; 100 to 800 kPa)
  - 4. 1" PGV globe valve w/1" HY100 filter system with 25 psi regulator.
- B. Automatic Control Valve:
  - 1. Body made of high-strength, non-corrosive PVC material.
  - 2. Pressure regulating (25 psi).
  - 3. Slow and smooth opening and closing with a manual flow control and internal bleed screw.
  - 4. Highly efficient, totally encapsulated 24 VAC solenoid.
  - 5. High-strength rubber or synthetic rubber diaphragm.
- C. Gate Valve: Threaded brass construction, 200 psi rated (minimum) and sized according to main line.
- D. Manual Drain Valve: ¾ inch bronze body, angle valve with replaceable seat disc and brass cross handle.

## **2.3 BACKFLOW PREVENTER**

- A. Body and caps constructed of bronze with wear and corrosion resistant internal parts complete with bronze quarter turn ball valves.
- B. Reduced Pressure Principle Device (RP) as specified in ASSE 1013.
- C. Double Check Valve (DCV) as specified in ASSE 1015.
- D. Capable of being tested and serviced without removal of device from the line.

## **2.4 AUTOMATIC CONTROLLER**

- A. Hunter Wireless Valve System to be used:
  - 1. Wireless, radio-controlled operation up to 100' away.
  - 2. Latching solenoid design for minimal power consumption.
  - 3. Fully submersible and waterproof up to 12 feet.
  - 4. Each valve set up with own start time, run time and day schedule.
  - 5. Controller attaches out of sight in valve box.
  - 6. Double-sealed battery compartment.
  - 7. Weather sensible compatible.

## **2.5 PEDESTAL**

- A. Free-standing unit with a weather resistant coating typically specified for the controller. Hardware included. Not Required.

## **2.6 SPRINKLER HEADS**

- A. Fixed Riser
  - 1. ½ inch x 24 inch schedule 80 riser Male Pipe Threads (MPT).
  - 2. ½ inch shrub head adaptor Female Pipe Threads (FPT) x MPT.
  - 3. ½ inch FPT barbed swing pipe adapter.
- B. Pop-up Spray Head
  - 1. Made of plastic and stainless steel materials.
  - 2. Pop-up risers of 4 inch, 6 inch, and 12 inch.
  - 3. Stainless steel retraction spring.
  - 4. Ratcheting mechanism.
  - 5. Side and bottom inlets on 6 inch and 12 inch heads.
- C. Rotary Head
  - 1. High-impact plastic construction with stainless steel ratcheting riser.
  - 2. 4 inch minimum pop-up with water-lubricated gear driven design.
  - 3. Integral rubber cover.
  - 4. Heavy-duty, stainless steel retraction spring.
  - 5. Built-in check valve.
- D. Pop-up Impact Head
  - 1. High-impact plastic construction with plastic clapper.
  - 2. 4 inch pop-up design with internal wiper seals.
  - 3. Heavy-duty, stainless steel retraction spring.
  - 4. Built in check valve required when used with more than 3 feet of elevation change on the lateral line.
  - 5. Plastic Sprinkler Nozzles
    - a. Interchangeable.

- b. Matched precipitation.
  - 6.  $\frac{3}{4}$  inch side or bottom inlet.
- E. Above-ground Impact
  - 1. Brass construction with stainless steel clapper.
  - 2. Mounted above ground with no pop-up features.
  - 3. 4 inch riser mounted impact.
  - 4.  $\frac{3}{4}$  inch MPT inlet.
  - 5. Brass Sprinkler Nozzles.
    - a. Interchangeable.
    - b. Matched precipitation.

## **2.7 PLASTIC NOZZLES**

- A. Fixed Spray
  - 1. Radius patterns and gal/min as shown on plans.
  - 2. Matched precipitation rates.
  - 3. Stainless steel adjustment screw.
  - 4. FPT to match  $\frac{1}{2}$  inch shrub head adapter.
  - 5. Pressure regulating: (Required when the psi at the sprinkler does not fall within the range recommended for its use.) See manufacturer's specifications.
  - 6. Filter screen.
- B. Bubbler
  - 1. Made of high-impact plastic.
  - 2. Pressure compensating with adjustable flow and radius as shown on plans.
  - 3. 2 inch FPT.
  - 4. Attach to fixed riser or pop-up spray.
  - 5. Filter screen.

## **2.8 DRIP TUBING**

- A. Self cleaning, pressure compensating, polyethylene dripperline.
- B. Dripper discharge: 0.6 gal/hr to 0.9 gal/hr and choice of 12 inch, 18 inch, or 24 inch spacing.
- C. Pressure compensation range from 8 psi to 60 psi.
- D. 0.63 inch ( $\nabla$ 0.01 inch) outside diameter; 0.54 inch ( $\nabla$ 0.01 inch) inside diameter.

## **2.9 LINE FLUSHING VALVE**

- A. Made of high impact plastic.

- B. Maximum flow rate per flush valve: 15 gal/min.
- C. Automatic cleaning operation.
- D. Can be disassembled allowing for winterization blow-out.
- E. 1/2 inch MPT threads.

#### **2.10 AIR/VACUUM RELIEF VALVE**

- A. Brass body and cap and rated to 200 psi.
- B. Temperature resistant silicone disc seat.

#### **2.11 DISK FILTER**

- A. Corrosion resistant thermoplastic design.
- B. Multiple disk filter design: 120 mesh.
- C. 1 inch MPT threads.
- D. Shut-off valve.
- E. Constructed of durable, non-corrosive components and equipped with O-ring seals.

#### **2.12 AY@ FILTER**

- A. 1 inch threaded inlet and outlet.
- B. 100 mesh polyester filter screen.
- C. Constructed of durable, non-corrosive components and equipped with an O-ring seal.
- D. Operating flow range of 1 gal/min to 15 gal/min with a pressure range of 10 psi to 150 psi.
- E. Easy removable cap and screen.

#### **2.13 SWING PIPE**

- A. Flexible Polyethylene Pipe: Maximum flow 6.0 gal/min. Inside diameter of  $\frac{1}{2}$  inch ( $\nabla 0.01$  inch) with a wall thickness of  $\frac{3}{32}$  inch ( $\nabla 0.01$  inch) and 80 psi rated.
- B. Flexible Polyethylene Pipe: For flows exceeding 6 gal/min. Inside diameter of  $\frac{15}{16}$  inch ( $\nabla 0.01$  inch) with a wall thickness of  $\frac{3}{32}$  inch ( $\nabla 0.01$  inch) and 80 psi rated.
- C.  $\frac{1}{2}$  inch Barbed Male Elbow: Plastic
- D.  $\frac{3}{4}$  inch Barbed Male Elbow: Plastic
- E. 1 inch Barbed Male Elbow: Plastic

## **2.14 VALVE BOX**

- A. Precast concrete or plastic with adequate hand room to operate small tools and provisions for locking cover to frame.
  - 1. Install a minimum depth of 6" of  $\frac{3}{4}$ " washed gravel below valve box with a minimum of 3" of clearance between the pipe and the gravel bedding.

## **2.15 WIRE**

- A. Provide wire for connecting remote control valves to the automatic controllers that is Type "UF", 600 V, stranded or solid copper, single conductor wire with PVC insulation and bearing UL approval for direct underground burial feeder cable.
  - 1. Make all connections with UL approved type seal to make a waterproof connection.
  - 2. Where possible, bury wires in the same trench as the pipe.
- B. Provide wire with 0.060 inches insulation, minimum covering of ICC-100 compound for positive weatherproofing protection.
  - 1. For wire sizes 14, 12, 10, and 8 use a single conductor solid copper wire, and for sizes 6 and 4 use stranded copper wire.
  - 2. Make control or "hot" wires red and all common or "ground" wires white.

## **2.16 QUICK COUPLER**

- A. Constructed of heavy duty brass with a  $\frac{3}{4}$  inch one-piece body design.
- B. Operating flow range of 10 gal/min to 50 gal/min with a pressure range of 25 psi to 100 psi.
- C.  $\frac{3}{4}$  inch brass valve key.

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- D.      $\frac{3}{4}$  inch brass swivel hose ell.
- E.     Stainless steel spring.

### **2.17   WASHED AGGREGATE**

- A.     1-1/2 inch maximum with 100 percent retained on a No. 4 sieve.

### **2.18   JOINT PRIMER AND SOLVENT CEMENT**

- A.     As specified in references.   ASTM F 656, and ASTM D 2672.

### **2.19   ACCESS SLEEVE**

- A.     2 inch, Schedule 40 PVC with a yellow rubber cap.

### **2.20   TEFLON TAPE**

- A.     For use on threaded joints.   Quality grade, 0.004 inch ( $\nabla$  0.001) and domestically made.

## **PART 3     EXECUTION**

### **3.1     EXCAVATION**

- A.     Stake pipe and sprinkler locations for approval.
- B.     Excavate trenches for sprinkler system pipe to provide 18 inches of cover over main lines and 9 inches over lateral lines.
  - 1.     Where trenching is required in proximity to trees that are to remain, do not damage roots.
- C.     Barricade trenches within the clear zone and along pedestrian routes that are left open overnight.

### **3.2     INSTALLATION**

- A.     General: Proceed with installation in accordance with the following:
  - 1.     Install stop and waste valves, backflow preventers and other equipment required by local authorities according to Utah Laws and Regulations to make system complete.
  - 2.     Install main line, automatic control valves, lateral lines, fittings, and heads/drip line as specified.

3. Thoroughly flush main lines before installing automatic control valves, and laterals before installing sprinklers. Flush supply lines thoroughly before installing backflow preventers or other regulating devices.
  4. After completion of grading, seeding or sodding, and rolling of grass areas, adjust heads to be plumb and flush with finished grades (flush is even with top of soil level or top of material level).
- B. Piping: Assemble all mainline and lateral lines in accordance with manufacturer's recommendations with no cul-de-sacs.
1. At wall penetrations, pack the opening around the pipe with non-shrink grout. At exterior face, fill perimeter slot with backer rod and sealant. Repair below grade waterproofing and make penetration watertight.
  2. Install PVC pipe in dry weather above 40 degrees F as specified by manufacturers recommendations. Allow joints to cure a minimum of 8 hours before testing.
- C. Sleeving: Coordinate sleeving installation before placing pavement.
- D. Control Valves:
1. Use Schedule 80 PVC pipe for nipples on valve header, length as necessary. Install valves two maximum per each standard, plastic valve box and provide 12 inches of expansion loop slack wire at all connections inside valve box.
- E. Manual Drains: Install at locations indicated on plans and according to detail.
- F. Quick-Coupling Valves: Install using  $\frac{3}{4}$  inch Schedule 80 PVC nipples for risers and elbows.
- G. Backflow Preventers:
1. Install assembly using the detail.
  2. In below grade installations, provide washed aggregate drain sump.
- H. Valve Access Boxes:
1. Install over all automatic control valves, manual control valves, or zone shutoff valves and sized to provide adequate room for maintenance.
  2. Install valve boxes flush with finish grade and place parallel or perpendicular to adjacent curbs, sidewalks, or driveways.
  3. Imprint a valve control number on each valve box cover that corresponds to the valve controller (clock). Print the valve box number one inch high (minimum) in a permanent and legible manner.
  4. Place washed aggregate in sump.
- I. Automatic Controller:
1. Install the Wireless Valve System in accordance to the manufactures recommendations.

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2. Program all station controllers to provide the appropriate amount of water for each station.
  3. Supply the Engineer with the manufacturers warranty and operating instructions for the Wireless Valve System.
- J. Wire and Electrical Work:
1. Use electrical control and ground wire suitable for sprinkler control cable of size indicated on plans.
  2. Tape control wires to underside of pipe at 15 ft intervals.
- K. Spray Heads, Fixed Risers and Bubblers:
1. Install as per plans.
  2. Adjust sprinkler nozzles to allow for adequate coverage and minimize overspray onto walks, roads, driveways, and buildings.

### **3.3 TESTING**

- A. Notify the Engineer 24 hours in advance of pressure testing the main line.
- B. Before backfilling and after air pockets have been vented from the lines, subject all supply and pressure irrigation lines to a hydrostatic pressure test by maintaining full supply line water pressure for 3 consecutive hours.
- C. Test connections for leaks prior to backfilling and repair all leaks. Lateral lines may be tested in sections to expedite backfilling work.

### **3.4 BACKFILLING OPERATION**

- A. Bed all pipe 2 inch (minimum) surrounding the pipe with native material excavated from the trench and passing through a 1/2 inch sieve.
- B. Prevent soil, rocks, or debris from entering pipes or sleeves.
- C. Compact backfilled trenches thoroughly to prevent settling damage to grades or plant materials. Repair irrigation system and plants at no additional cost.

### **3.5 IRRIGATION INSTALLATION INSPECTION**

- A. Notify the Engineer to schedule the inspection with the Engineer after the irrigation system is completely installed and fully functional.
- B. Make the required field adjustments and changes after the inspection.

END OF SECTION



September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02813S**

**DISINFECTION OF WATER DISTRIBUTION SYSTEM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Disinfection of project pipe lines specified in Section 02510.
- B. Disinfection of site domestic water lines, site fire water lines, and hydrant supply lines and water service lines specified in Section 02812S.
- C. Testing and reporting results.

**1.02 RELATED SECTIONS**

- A. Section 02812S - Water Distribution System.

**1.03 REFERENCES**

- A. AWWA B300 - Hypochlorites; American Water Works Association; (ANSI/AWWA B300).
- B. AWWA B301 - Liquid Chlorine; American Water Works Association; (ANSI/AWWA B301).
- C. AWWA B302 - Ammonium Sulfate; American Water Works Association; (ANSI/AWWA B302).
- D. AWWA B303 - Sodium Chlorite; American Water Works Association; (ANSI/AWWA B303).
- E. AWWA C651 - Disinfecting Water Mains; American Water Works Association; (ANSI/AWWA C651).
- F. Use latest issue of the above reference standards as of the date of the project.

#### **1.04 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Test Reports: Indicate results comparative to specified requirements.
- C. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.
- D. Disinfection report:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of disinfectant injection start and time of completion.
  - 3. Test locations.
  - 4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
  - 5. Date and time of flushing start and completion.
  - 6. Disinfectant residual after flushing in ppm for each outlet tested.
- E. Bacteriological report:
  - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
  - 2. Time and date of water sample collection.
  - 3. Name of person collecting samples.
  - 4. Test locations.
  - 5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
  - 6. Initial and 24 hour coliform bacteria test results for each outlet tested.
  - 7. Certification that water conforms, or fails to conform, to bacterial standards of State.

#### **1.05 QUALITY ASSURANCE**

- A. Perform Work in accordance with AWWA C651.
- B. Testing Firm: Company specializing in testing potable water systems, certified by governing authorities of Utah.
- C. Submit bacteriologist's signature and authority associated with testing.

#### **1.06 REGULATORY REQUIREMENTS**

- A. Conform to applicable code or regulation for performing the work of this Section.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of water system.

## **PART 2 PRODUCTS**

### **2.01 DISINFECTION CHEMICALS**

- A. Chemicals: AWWA B300, Hypochlorite, AWWA B301, Liquid Chlorine, AWWA B302, Ammonium Sulfate, and AWWA B303, Sodium Chlorite.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that piping system has been cleaned, inspected, and pressure tested.

### **3.02 EXECUTION**

- A. Provide and attach required equipment to perform the work of this Section.
- B. Introduce treatment into piping system.
- C. Maintain disinfectant in system for 24 hours.
- D. Dispose of chlorinated water in a manner acceptable to the City Engineer.
- E. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.
- F. Replace permanent system devices removed for disinfection.
- G. Pressure test system to 1.25 times the system working pressure, in psi. Repair leaks and re-test.

### **3.03 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance with Specifications.
- B. Test samples in accordance with AWWA C651.

## **END OF SECTION**

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**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02821M**

**CHAIN LINK FENCING AND GATES**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Materials and procedures for installing chain link fencing and gates.

**1.2 RELATED SECTIONS**

- A. Section 03055: Portland Cement Concrete

**1.3 REFERENCES**

- A. AASHTO M 111: Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
- B. AASHTO M 181: Chain Link Fence
- C. AASHTO M 232: Zinc Coating (Hot Dip) on Iron and Steel Hardware
- D. AASHTO M 280: Zinc-Coated (Galvanized) Steel Barbed Wire
- E. AASHTO M 305: Aluminum Coated Steel Barbed Wire
- F. ASTM A 392: Zinc-Coated Steel Chain-Link Fence Fabric
- G. ASTM A 491: Aluminum-Coated Steel Chain-Link Fence Fabric
- H. ASTM F 1083: Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

**PART 2 PRODUCTS**

**2.1 GENERAL**

- A. Class B Concrete. Refer to Section 03055.

## **2.2 POSTS, CAPS, RAILS, COUPLINGS**

- A. Pipe posts and rails:
  - 1. Schedule 40, hot-dip galvanized coated pipe. ASTM F 1083.
- B. Fitting: malleable cast iron or pressed steel coated as specified. AASHTO M 232.
- C. Caps: AASHTO M 232
  - 1. Equip all pipe posts with a galvanized steel or malleable iron weather-resistant cap, designed to fit securely over the posts and carry an apron around the outside of the post.
  - 2. Where top rail is used, provide cap to permit passage of top rail.

## **2.3 CHAIN LINK FABRIC**

- A. Provide either Type I zinc-coated steel or Type II aluminum-coated steel fence fabric as specified. Refer to AASHTO M 181, ASTM A 392, and ASTM A 491.
- B. Use 0.148 inch diameter wire for fence fabric 6 ft or higher and 0.120 inch diameter wire for fabric less than 6 ft high.
- C. Provide 0.177 inch diameter spiral material for tension wires.
- D. Tie fabric to supporting members of the same diameter as the fence fabric.

## **2.4 BARBED WIRE**

- A. Provide zinc-coated barbed wire when zinc-coated fence is used. Refer to AASHTO M 280.
- B. Use 0.099 inch diameter barbed wire with 0.080 inch diameter 4-point barbs on 5 inch centers.
- C. Provide aluminum-coated barbed wire when aluminum-coated fence is used. Refer to AASHTO M 305.
- D. Support arm on the fence for barbed wire must support a 200 lb vertical load at the end of the arm without causing permanent deflection.

## 2.5 GATES

- A. Construct gate posts and frames of the sizes following FG series Standard Drawings.
  - 1. Fasten gate frame corners together with pressed steel or malleable iron corner ells, riveted or welded as shown.
  - 2. Galvanize welded steel gate frames after fabrication as specified. AASHTO M 111.
  - 3. Do not use closed cells that would prohibit dipping to galvanizing tanks.
- B. Follow the same standards for chain link fence fabric for covering the gate frames as for other fence fabric.
- C. Furnish each gate with the appropriate hinges, latch, and drop-bar locking device.

## PART 3 EXECUTION

### 3.1 INSTALLING POSTS

- A. Install following FG series Standard Drawings.
- B. Do not exceed the following spacing requirements when placing posts:

<u>Radii of Curve</u>	<u>Maximum Post Spacing</u>
Tangent or 500 ft	10 ft
200 ft to 500 ft	8 ft
100 ft to 200 ft	6 ft
0 ft to 100 ft	5 ft

- C. Install brace posts at maximum 500 ft intervals or at angle points of 30 degrees or more.
- D. Set posts in concrete walls or masonry where required.
  - 1. Set posts or post sockets in concrete walls to a minimum 18 in depth.
  - 2. Use 0.048 inch thick galvanized metal pipe sleeve socket with an inside diameter that allows post to fit loosely.
  - 3. Coat the inside of the socket and the outside of the posts with bituminous paint.
  - 4. Use sulfur caulk or other expansive grout to fasten the post in the socket.
- E. Set posts in concrete bases.
  - 1. Place concrete a minimum of 6 inches below each post.

2. Construct at least 12 inch diameter bases for end posts, pull posts, corner posts, gate posts, and line posts.

### 3.2 INSTALLING FENCE FABRIC

- A. Place fence fabric on the roadway side of posts unless otherwise specified.
  1. Place fabric approximately 1 inch above the ground.
  2. Maintain a straight grade between posts by excavating high points of the ground.
  3. Fill depression in the natural ground to within 1 inch of the bottom of fence.
- B. Stretch the fabric taut and securely fasten to fence posts.
  1. Use stretch bars and metal bands to fasten material to end, gate, corner, and pull posts.
  2. Space metal bands at 1 ft intervals along the post.
  3. Cut the fabric at all pull and corner posts.
  4. Fasten fabric to line posts with tie wires or metal bands at 14 inch intervals.
  5. Attach the top edge of fabric to the top rail or tension cable with wire ties at approximately 24 inch intervals.
  6. Attach bottom of fabric to bottom tension wire, and the bottom edge of the fabric to the bottom tension wire with wire ties spaced at 24 inch intervals.

### 3.3 INSTALLING GATES

- A. Install single gate or double gate as specified. Install plumb, level, and secure for full opening without interference.
- B. Install ground-set items in concrete for anchorage as shown in the Standard Drawing or as recommended by the fence manufacturer. Adjust hardware for smooth operation.
- C. Set gate openings according to manufacturer=s dimensions.
- D. Fabric description numbers:
  1. First number indicates height.
  2. Second number indicates width of fabric opening.

### 3.4 VINYL SLATS

- A. Install single gate or double gate as per manufacturer's specifications.
- B. **Materials:** Extruded from High Density Polyethylene (HDPE), color pigments and ultra violet (UV) inhibitors, specifically designed to retard the harmful effects of the sun and lengthen the life of the product

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- C. Product shall be “Bottom-Locking Slats”. Slats shall be 3 ½” shorter than the overall height of the fence. The privacy factor shall be approximately 75%. Slat width is 1 3/32”. Slat is manufactured for 2” mesh, 9 ,11 or 11 ½ inch gauge wire.
- D. A Safety Top Cap shall be included. Cap shall be 5 ½” in height and 2 ¾” wide.
- E. Color selection by owner.

END OF SECTION



**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02833S**

**MSE WALLS USING CONCRETE FACING PANELS AND  
METAL REINFORCING ELEMENTS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Furnish material and construct mechanically stabilized earth (MSE) walls using an approved wall system employing metal reinforcing elements.
- B. Make arrangements to purchase the face panels, reinforcing steel, tie strips, fasteners, joint filler, and all necessary attachments from selected Wall Company.

**1.2 RELATED SECTIONS**

- A. Section 02861S: Retaining Wall- Alternate Systems
- B. Section 02862S: Select Material for MSE Walls
- C. Section 03055: Portland Cement Concrete
- D. Section 03211: Reinforcing Steel and Welded Wire
- E. Section 03310: Structural Concrete
- F. Section 03935: Epoxy Injection and Sealing

**1.3 SUBMITTALS**

- A. Submit sample of the texture for approval by the project aesthetics committee.
- B. Provide verification that special design of the upper 10 feet of wall has been completed at locations where the design earthquake peak horizontal ground acceleration coefficient is 0.30g or greater.
- C. Provide design details which protect the reinforcement connections from corrosion due to salt.
- D. Provide all other submittals required in Section 02861 S.

- E. Do not start work on any wall until working drawings have been reviewed by the Engineer. Review of the drawings does not relieve the Contractor of any responsibility under the contract for the successful completion of the work.

## **PART 2 PRODUCTS**

### **2.1 PRECAST CONCRETE WALL PANELS**

- A. Concrete. Class AA(AE) per Section 03055 and Section 03310, having  $f'_c$  (at 28 days) of at least 4000 psi.
- B. Uniformity. The architectural treatment for all MSE panel walls to be consistent throughout the project and match all other structural elements incorporated in the project.
- C. Reinforcing steel to have a minimum cover of 2.0 inches.
- D. Casting. Cast panels on a flat area or approved architectural treatment, with the front face down. Tie strip guides to be set at back face. The concrete in each unit to be placed without interruption. Vibration performed with approved equipment, such that the concrete is forced into corners of the forms to prevent stone pockets or cleavage planes. Use clean form oil.
- E. Reinforcement Connections. All full-size concrete panels to have at least two soil reinforcement connection levels cast into the panels. Where only two connection levels are cast in panels, the levels shall be located in two different horizontal planes which are separated by a minimum of one-third the panel height.
- F. Curing. Use membrane-curing compound method
  1. Keep surfaces wet and moist until the curing compound is applied.
  2. Complete all patching or surface finishing before applying compound.
  3. Spray the entire surface of the concrete with a membrane curing compound. Apply the compound at a uniform rate of 1.25 oz/ft<sup>2</sup> of area.
  4. Immediately re-spray any membrane damage which occurs during the curing period.
  5. Removal of Forms. Leave forms in place until they can be removed without damage to the unit.
- G. Concrete Finish
  1. Front face of panels for wall to have a Class 1 finish. Thickness of architectural treatment shall be in addition to required design thickness of wall.
  2. The back face of panels to have a uniform surface finish. The finish to be roughly screened to eliminate open pockets of aggregate and surface distortion in excess of 1/4 inch.

H. Tolerances

1. All dimensions  $\pm 1/8$  inch.
2. Angular distortion with regard to the height of panel not to exceed  $3/16$  inch in 5 feet.
3. Surface defects on form surfaces not more than  $1/8$  inch in 5 feet.

I. Rejection. Panels will be subject to rejection if:

1. They do not meet the above-mentioned requirements.
2. They contain defects due to imperfect molding.
3. They have any honeycomb.
4. They have open texture on front face.
5. They have cracks or spalls that exceed the limits specified in Article 3.6-Crack and Spall Repair Criteria for Concrete Panels.

J. Marking. Mark the date of manufacture on the rear of each panel.

**2.2 REINFORCING STEEL**

- A. Epoxy coated 20 mils thick and conforming to Section 03211.
- B. All reinforcing steel to be the specified size and free from any defects.

**2.3 LEVELING PAD CONCRETE**

- A. Use Class A or Class B concrete per Section 03055.

**2.4 REINFORCING STRIPS**

- A. Hot rolled from steel bars, galvanize coated 3.4 mils thick, meeting minimum requirements of ASTM D1784, Grade 65; AASHTO M-111 and ASTM A-123.
- B. All reinforcing strips to be the specified size (See 02861 S, Article 1.1E-1) and free from defects.

**2.5 REINFORCED WELDED WIRE MESH AND LOOP INBEDS**

- A. Meeting minimum requirements of AASHTO M-32 and AASHTO M-55; and be galvanize coated 3.4 mils thick as per AASHTO M-111 (ASTM A-123).

**2.6 TIE STRIPS**

- A. Shop fabricated, hot rolled steel conforming to minimum requirements of ASTM A-709M, Grade 345; ASTM A-123; and ASTM A-570, Grade 345 or equivalent, galvanize coated 3.4 mils thick.
- B. All tie strips to be the specified size and free from any defects.

**2.7 PANEL FASTENERS**

- A. Bolts and nuts to be hexagonal cap screw and galvanize coated, meeting minimum requirements of ASTM A-325 and ASTM A-153.

**2.8 OTHER FASTENERS**

- A. Fasteners to wingwalls and abutment walls, if required, to be provided by the Wall Company.

**2.9 DAMAGED GALVANIZATION**

- A. As an alternative to replacement, any reinforcing steel, reinforcing strips, wire mesh or fasteners that has damaged galvanization, spray with zinc paint covering the entire area that has been damaged.

**2.10 CURING COMPOUND**

- A. AASHTO M-148 Type 1-D, Class A.

**2.11 GEOTEXTILE**

- A. When required, horizontal and vertical joints between panels to be covered by a geotextile of type and grade as recommended by the Wall Company.

**2.12 ADHESIVE**

- A. Per Wall Company's standard.

**2.13 BEARING PADS**

- A. Horizontal rubber bearing pads to be of type and grade recommended and supplied by the Wall Company.

**2.14 LIFTING DEVICES**

- A. Per Wall Company's standard.

**2.15 SELECT MATERIAL FOR MSE WALL BACKFILL**

- A. See Section 02862 S- Select Material for MSE walls.

**2.16 MATERIALS FOR CRACK AND SPALL REPAIR**

- A. See Section 03935- Epoxy Injection and Sealing.

## **PART 3      EXECUTION**

### **3.1      GENERAL**

- A.     Arrange for a qualified representative (minimum 5 years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s). As a minimum, the Wall Company representative to be at the project site during the first two weeks of wall construction, and shall make visits to the site at least once every two weeks thereafter. During each site visit, the representative to meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures. If one or more construction crew members change, the Wall Company representative shall directly review with the new crew member(s) the important wall construction elements.
- B.     The Wall Company to provide assurance that the completed wall(s) meet all Department and Wall Company specifications. Note: Where the Department's and the Wall Company's specifications differ, the stricter of the two shall be applied. The representative is responsible for training the Contractor's inspectors in proper quality control for construction of the walls. The Wall Company representative shall report any irregularities to the Engineer.
- C.     Haul, store, and ship wall materials so as to minimize the potential of producing any type of defects. Store panels such that the tie strips do not bend.
- D.     Perform excavation and foundation preparation (including removal of unsuitable soils) as described in Section 02862 S.
- E.     Construct wall system in accordance with the approved plans, this specification, and the Wall Company's recommendations and construction manual.

### **3.2      LEVELING PAD**

- A.     Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings, to ensure complete contact of the retaining wall units with the base.
- B.     Place cast-in-place concrete leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02862 S. Place leveling pad to a minimum thickness of 6 inches.
- C.     Placement requirements to be per Section 03055, except that placement time limits are increased by 20 minutes from those presented in Section 03055, Article 3.7-A.
- D.     Allow leveling pad to cure for at least 12 hours prior to placing concrete panels.
- E.     Use rubber, wood, or metal shims as necessary to make final adjustments to the

wall panel to facilitate level placement of the panel.

### **3.3 WALL CONSTRUCTION**

- A. Place wall backfill and reinforcement as described in Section 02862 S.
- B. Handle panels by means of lifting device set into upper edge of the panels and set in position vertically.
- C. Place panels on successive horizontal lifts in the sequence shown on the approved plans as backfill placement proceeds.
- D. Place panels initially at a slight batter towards the backfill in order to compensate for outward rotation of the panel consequent upon fill placement and compaction.
- E. Assuming reinforcement layers must be partially or fully served in the location of an obstruction (such as a caisson foundation, guardrail post, catch basin, drop inlet, or culvert) in the wall soil reinforcement zone, modify the reinforcement design using one of the following three alternatives:
  - 1. Design the surrounding reinforcement layers to carry the additional load which would have been carried by the severed reinforcement
  - 2. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.
  - 3. If the soil reinforcement consists of discrete strips or bar mats rather than continuous sheets, splay the reinforcement around the obstruction.
- F. Soil reinforcement strips generally to be placed normal to the face of the wall in plan view. However, where required to splay the strips around obstructions, the strips shall be skewed (minimizing the skew angle), but no more than 15 degrees unless approved by the Wall Company. However, in no case shall the maximum horizontal spacing between longitudinal reinforcing straps be greater than 7 feet.
- G. Wall panel horizontal alignment tolerance is 0.7 percent (for example 2.5 inches in 30 feet). Vertical tolerance is 0.7 percent (for example 0.85 inches in 10 feet). The overall vertical tolerance of the wall (plumbness from top to bottom) not to exceed 0.5 percent (for example 1.2 inches in 20 feet of wall height). Wall panel levelness tolerance not to exceed 0.5 percent (for example 1.2 inches in 20 feet).
- H. All joints to be uniform. During construction the maximum allowable offset in any panel joint is 0.40 inch. Joint width for single-stage walls is 1.2 inches maximum and 0.60 inch minimum; and for two-stage walls is 1.0 inch maximum and 0.70 inch minimum.
- I. Check panel tolerance and reset prior to placement of the next panel if out of specification.

### **3.4 SAMPLING AND TESTING**

- A. Certificates of Compliance. Furnish to the Engineer copies of the certificate of compliance for materials and the results of any tests performed by the Wall Company on the materials.
- B. Select Material Density Testing. The Engineer to make at least one density determination per 8-inch lift for each 100 feet of retaining wall. The tests will be made at random locations, and/or at the Engineer's discretion.
- C. Concrete Testing. Strength, slump, air, and yield tests will be conducted in accordance with Section 03055.

### **3.5 PANEL ACCEPTANCE**

- A. Meet 28-day compression test. Panels which meet 75 percent of 28-day strength within 7 days are acceptable for placement in the wall.
- B. No precast panel to be placed in the wall unit until it has been cured for a minimum of 7 days.
- C. All panels to be visually free of defects.
- D. Submit certificate of compliance to the Engineer.

### **3.6 CRACK AND SPALL REPAIR CRITERIA FOR CONCRETE PANELS**

- A. A fully penetrating crack is defined as a crack extending through the cross-section of the precast panel from the front face to the back face of the unit.
- B. Cracks at Front Face of Panel:
  - 1. Partially penetrating cracks with widths less than or equal to 12 mils are acceptable without repair.
  - 2. Reject panels with fully penetrating cracks, or cracks wider than 12 mils.
  - 3. No more than two (2) cracks per individual panel are allowed without further evaluation.
- C. Cracks at Back Face of Panel:
  - 1. Partially penetrating cracks with widths less than or equal to 12 mils are acceptable without repair.
  - 2. Partially penetrating cracks with widths between 12 mils and 30 mils are acceptable when repaired with surface sealant according to paragraph F, Crack Repair Procedures.
  - 3. Evaluate partially penetrating cracks wider than 30 mils for acceptance with epoxy injection according to Article 3.6-F, Crack Repair Procedures.
  - 4. No more than two (2) repairable cracks per individual panel are allowed without further evaluation.

D. Spalls at Front Face of Panel:

1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a Department-approved patching material of the same color as panel concrete.
2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Measure spall depth from the structural thickness of the panel excluding architectural surface finish.
4. Panels with an excessive number of spalls ( $> 2$  /panel) are subject to further evaluation prior to acceptance.

E. Spalls at Back Face of Panel:

1. Spalls with widths less than 4.0 inches and depths less than 2.0 inches may be repaired with a Department-approved patching material.
2. Reject panels with spalls wider than 4.0 inches or deeper than 2.0 inches.
3. Panels with an excessive number of spalls ( $> 4$  /panel) are subject to further evaluation prior to acceptance.

F. Crack Repair Procedures:

1. Surface Sealing. Prepare surface and apply a Department-approved sealant according to Manufacturer's instructions.
2. Epoxy Injection. Prepare surface and inject cracks with Department-approved product according to Manufacturer's instructions.

G. Spall Repair Procedures. Prepare surface and apply patching material according to Manufacturer's instructions.

**END OF SECTION**



**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02861S**

**RETAINING WALL - ALTERNATE SYSTEMS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. The plans include situation and layout drawings for the walls, which the Contractor will be required to select from the following wall systems, to be used for retaining walls indicated as the Contractor-selected alternative system on the project. Contractor will only use an MSE block type wall. Contractor has the option to use any of the following options.
  - 1. Option A- MSE Wall- Genesis Geogrid Retaining Wall (refer to Section 02864 S)
  - 2. Option B- MSE Wall- MESA Retaining Wall (refer to Section 02864 S)
  - 3. Option C- MSE Wall- KeySystemI Retaining Wall (refer to Sec. 02835S)

**1.2 RELATED WORK**

- A. UDOT Standard Drawings: Concrete Retaining Wall
- B. Section 02862 S: Select Material for MSE Walls
- C. Section 02833 S: MSE Walls Using Concrete Facing Panels and Metal Reinforcing Elements
- D. Section 02864 S: MSE Walls Using Modular Blocks and Geogrid Reinforcing Elements

**1.3 WALL SYSTEMS SELECTION**

- A. Notify the Department in writing, on or before the preconstruction conference, which option will be used at each location. Selection must be made only from the options listed in article 1.1.A.
- B. Only one MSE wall system will be allowed for the Contractor-selected alternative system. However, in addition to the selected MSE wall system, Option A- concrete Retaining Wall may be used at selected locations.
- C. No changes to the wall types will be allowed following the preconstruction conference without specific written approval from the Department.

## 1.4 DESIGN REQUIREMENTS

- A. Incorporate all current FHWA guidelines, AASHTO Specifications, and Interim Specifications for Highway Bridges in design of the selected MSE wall system, in addition to, or as modified by the following:
1. For all walls located within 50 feet of bridge abutments, use a design earthquake peak horizontal ground acceleration coefficient corresponding to a 10% exceedence in 250 years. For the area of construction, this has been estimated at **25%** (see *GEOTECHNICAL STUDY 300 WEST STREET IMPROVEMENT RIVERDALE, UTAH* by Earthtec Testing & Engineering, P.C. November 2001). For all other walls, use an acceleration coefficient corresponding to a 10% exceedence in 50 years. Design retaining wall panel connections in all cases to not fail during the seismic event corresponding to 10% exceedence in 250 years.
  2. The Contractor-selected Wall Company is responsible for all stability calculations, except global stability and bearing capacity.
  3. Minimum service life of 75 years.
  4. Department special provision Sections 02862 S through 02838 S as appropriate for the selected wall system.
  5. Provide corrosion protection for metallic reinforcement systems by at least one of the following two measures:
    - a. Provide sacrificial steel sufficient for a corrosion rate of at least 0.80 mils/year per exposed surface after 16 years of corrosion protection service allowed for the galvanized coating.
    - b. Provide a protective geomembrane of at least 60 mils thickness above the final layer of reinforcement and lapped against the top facing element. If this measure is used, design the reinforcement to provide sacrificial steel sufficient for a corrosion rate of at least 0.50 mils/year per exposed surface after 16 years of corrosion protection service for the galvanized coating.
  6. To provide a coherent reinforced soil mass, use a vertical spacing of primary reinforcement not exceeding 30 inches for single-stage walls, or 24 inches for two-stage walls.
  7. In accordance with Section 5.8 of the AASHTO bridge design manual (AASHTO, 1996), provide horizontal benches a minimum of 4 feet in width at the base of walls to be founded on earth slopes. However, benches need not be provided for walls located adjacent to concrete slope-protected slopes.
  8. Provide soil design properties consisting of the moist density, friction angle, and cohesion for the foundation soil and for the retained soil at each wall location. Also provide the allowable bearing capacity of the foundation materials (incorporating any foundation treatments deemed necessary) at each wall location. The specific wall backfill characteristics are an integral part of the MSE wall design; ensure they are determined and/or verified by the selected Wall Company, with wall backfill meeting the requirements of Section 02862 S.

SOIL PROPERTIES	WALL BACKFILL	RETAINED SOIL	FOUNDATION SOIL
Moist Density (pcf)	*	125	120
Friction Angle (deg)	*	31°	31°
Cohesion (psf)	*	0	0
Foundation Soil Allowable Bearing Capacity (psf)	3,000		

\*The specific wall backfill characteristics are an integral part of the MSE wall design and shall be determined for the material by the selected Wall Company (with wall backfill meeting the requirements of Section 02862 S)

\*\*Moist Density varies; See the “GEOTECHNICAL STUDY 300 WEST STREET IMPROVEMENT RIVERDALE, UTAH by Earthtec Testing & Engineering, P.C. November 2001”

\*\*\***Do not use clay materials as backfill.** Where Clay material is encountered, the Contractor shall over-excavate 18-inches minimum and backfill with a granular structural fill as approved by the Engineer.

## 1.5 SUBMITTAL REQUIREMENTS AND REVIEW

- A. Prepare and submit construction shop drawings addressing the following design items to the Engineer, sufficient for construction of the walls including all necessary plans, profiles, cross sections, quantities, and details. Ensure that the shop drawings are prepared and signed by a licensed professional engineer.
  1. Cast-in-place concrete coping/cap to the facing panels/blocks to be aesthetically pleasing, and to adequately support any fence and/or barrier. Precast coping will not be accepted on the project without specific written approval from the Department.
  2. Provisions for facilities which penetrate the wall face or soil reinforcing elements (such as but not limited to drainage catch basins, piping, foundation elements, guard-rail posts, and other buried facilities).
  3. Surface and subsurface drainage details including end treatment details sufficient for protection of the wall system from erosion and excessive hydrostatic loading. Direct surface drainage at the ends of the walls to drainage catch basins. Provide design details for the drainage to the catch basins.
  4. Proposed architectural treatment detail for wall facing elements, and proposed color of concrete. Provide architectural treatment for all MSE panel-walls consistent throughout the project and matching all other structural elements incorporated in the project.
  5. Design calculations sufficient for review to determine that the walls have been designed in accordance with the required criteria. Ensure that the design calculations are prepared and signed by a registered professional engineer.
- B. Submit all specified submittals for review to the Engineer at least 4 weeks prior to

beginning wall construction. Begin no wall construction until written acceptance has been provided by the Engineer. If the Engineer determines that MSE wall submittals are not sufficient, re-submittals will be required and 2 weeks will be required after the date received for review of the re-submittals.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- A. All materials are as required in Sections 02862 S through 02838 S as appropriate for the selected wall system.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. All installation is as required in Sections 02862 S through 02838 S as appropriate for the selected wall system.

### **3.2 PRICE REDUCTIONS FOR NON-CONFORMING WORK**

- A. Price Adjustment- Reduction for Non-Conformance Select Material for MSE Walls Select Material used as MSE wall backfill which has been placed and whose chemical characteristics are found to be out of conformance with the requirements of Section 02862 S, will be considered for acceptance according to this Section.
  - 1. The Department will use the unit price stated in Section 3.21.2.2 (Price Reductions) of the RFP, and the pay factors schedule presented in Table 1 that follows, to calculate the price reduction to the Contractor's compensation.
  - 2. The Wall Company shall evaluate all MSE wall backfill cases where deviations from the project specifications exceed those presented in Table 1, in order to determine whether the wall system will meet the required design life. At the discretion of the Department, any such wall may be accepted at a 20 to 30 percent pay factor, in lieu of the backfill being removed and replaced with backfill meeting the project specifications.

**Table 1**

<b>PRICE REDUCTION PAY FACTORS FOR NON-CONFORMING MSE WALL BACKFILL</b>						
<b>Mean of the Deviations of Backfill Chemical Test Results from the Limits Specified in Section 02862 S</b>						
	<b>Pay Factor</b>	<b>1 Test</b>	<b>2 Tests</b>	<b>3 Tests</b>	<b>4 Tests</b>	<b>5 Tests or More</b>
<b>Resistivity (ohm-cm)</b>	1.00	0 to 200	<b>0 TO 190</b>	0 TO 180	0 to 170	0 to 150
	0.95	201 to 400	191 to 380	181 to 360	171 to 340	151 to 300
	0.90	401 to 600	381 to 570	361 to 540	341 to 510	301 to 450
	0.80	601 to 800	571 to 760	541 to 720	511 to 680	451 to 600
	0.70	801 to 1000	761 to 950	721 to 900	681 to 850	601 to 750
	0.60	1001 to 1200	951 to 1140	901 to 1080	851 to 1020	751 to 900
	0.50 <sup>a</sup>	over 1200	over 1141	over 1081	over 1021	over 901
a - But no one test below 1500 ohm-cm will be accepted.						
<b>pH</b>	1.00	0 to 0.20	0 to 0.18	0 to 0.16	0 to 0.14	0 to 0.12
	0.90	0.21 to 0.40	0.19 to 0.36	0.17 to 0.32	0.15 to 0.28	0.13 to 0.24
	0.80	0.41 to 0.60	0.37 to 0.54	0.33 to 0.48	0.29 to 0.42	0.25 to 0.36
	0.70	0.61 to 0.80	0.55 to 0.72	0.49 to 0.64	0.43 to 0.56	0.37 to 0.48
	0.60	0.81 to 1.00	0.73 to 0.90	0.65 to 0.80	0.57 to 0.70	0.49 to 0.60
	0.50 <sup>b</sup>	over 1.01	over 0.91	over 0.81	over 0.71	over 0.61
b - But no one test below 5.0 or above 10.0 will be accepted.						
<b>Chlorides (ppm)</b>	1.00	0 to 14	0 to 12	0 to 10	0 to 8	0 to 6
	0.95	15 to 28	13 to 24	11 to 20	9 to 16	7 to 12
	0.90	29 to 42	25 to 36	21 to 30	17 to 24	13 to 18
	0.80	43 to 56	37 to 48	31 to 40	25 to 32	19 to 24
	0.70	57 to 70	49 to 60	41 to 50	33 to 40	25 to 30
	0.60	71 to 84	61 to 72	51 to 60	41 to 48	31 to 36
	0.50 <sup>c</sup>	over 85	over 73	over 61	over 49	over 37
c - But no one test above 300 ppm will be accepted.						
<b>Sulfates (ppm)</b>	1.00	0 to 120	0 to 110	0 to 100	0 to 90	0 to 80
	0.95	121 to 240	111 to 220	101 to 200	91 to 180	81 to 160
	0.90	241 to 360	221 to 330	201 to 300	181 to 270	161 to 240
	0.80	361 to 480	331 to 440	301 to 400	271 to 360	241 to 320
	0.70	481 to 600	441 to 550	401 to 500	361 to 450	321 to 400
	0.60	601 to 720	551 to 660	501 to 600	451 to 540	401 to 480
	0.50 <sup>d</sup>	over 721	over 661	over 601	over 541	over 481
d - But no one test above 1000 ppm will be accepted.						

**Note:** The number of tests for price reduction determination will consist only of those tests performed at locations representative of the overall backfill mass with depth.

## B. Price Adjustment - Reduction for Out-of-Tolerance MSE Wall Facing Elements:

1. Provided that their structural adequacy can be demonstrated to the Department, facing elements which are placed and/or become out-of-tolerance from the tolerances stated in the applicable MSE wall system section (02833 S through 02837 S) prior to Final Owner's Acceptance, will be accepted according to this Section.
2. The Department will use the unit price stated in Section 3.21.2.2 (Price Reductions) of the RFP, and the pay factors schedule presented in Table 2 below to calculate the price reduction to the Contractor's compensation.
3. The Wall Company and the Department will evaluate all MSE wall facing elements cases where deviations from the project specifications exceed those presented in Table 2, in order to determine whether the wall system has sufficient structural integrity and is aesthetically acceptable. At the discretion of the Department, any such wall may be accepted at a 20 to 30 percent pay factor, in lieu of the wall being removed and reconstructed to the tolerances presented in the project specifications.

- C. Price Adjustment Application. The pay factors presented in Table 1 and Table 2 will be applied to the entire wall. However, only the most critical of any one of the backfill criteria or the facing elements tolerances (i.e. the one having the lowest pay factor), will be applied for the wall.

**Table 2**

<b>PRICE REDUCTION PAY FACTORS FOR OUT-OF-TOLERANCE MSE WALL FACING ELEMENTS</b>						
<b>Mean of the Deviations of Wall Placement Tolerances from the Limits Specified in Section 02833 S to 02837 S (based on the percentage of wall face having the maximum out-of-tolerance measurements)</b>						
	<b>Pay Factor</b>	<b>1 to 5%</b>	<b>6 to 10%</b>	<b>11 to 20%</b>	<b>21 to 30%</b>	<b>30% or more</b>
<b>Horizontal Alignment (percent) Spec – 0.7%</b>	1.00	0 to 0.40	0 to 0.35	0 to 0.30	0 to 0.25	0 to 0.20
	0.90	0.41 to 0.80	0.36 to 0.70	0.31 to 0.60	0.26 to 0.50	0.21 to 0.40
	0.80	0.81 to 1.20	0.71 to 1.05	0.61 to 0.90	0.51 to 0.75	0.41 to 0.60
	0.70	1.21 to 1.60	1.06 to 1.40	0.91 to 1.20	0.76 to 1.00	0.61 to 0.80
	0.60	1.61 to 2.00	1.41 to 1.75	1.21 to 1.50	1.01 to 1.25	0.81 to 1.00
	0.50	2.01 or more	1.76 or more	1.51 or more	1.26 or more	1.01 or more
<b>Vertical Alignment (percent) Spec – 0.7%</b>	1.00	0 to 0.40	0 to 0.35	0 to 0.30	0 to 0.25	0 to 0.20
	0.90	0.41 to 0.80	0.36 to 0.70	0.31 to 0.60	0.26 to 0.50	0.21 to 0.40
	0.80	0.81 to 1.20	0.71 to 1.05	0.61 to 0.90	0.51 to 0.75	0.41 to 0.60
	0.70	1.21 to 1.60	1.06 to 1.40	0.91 to 1.20	0.76 to 1.00	0.61 to 0.80
	0.60	1.61 to 2.00	1.41 to 1.75	1.21 to 1.50	1.01 to 1.25	0.81 to 1.00
	0.50	2.01 or more	1.76 or more	1.51 or more	1.26 or more	1.01 or more
<b>Plumbness (percent) Spec – 0.5%</b>	1.00	0 to 0.20	0 to 0.18	0 to 0.16	0 to 0.14	0 to 0.12
	0.90	0.21 to 0.40	0.19 to 0.36	0.17 to 0.32	0.15 to 0.28	0.13 to 0.24
	0.80	0.41 to 0.60	0.37 to 0.54	0.33 to 0.48	0.29 to 0.42	0.25 to 0.36

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	0.70	0.61 to 0.80	0.55 to 0.72	0.49 to 0.64	0.43 to 0.56	0.37 to 0.48
	0.60	0.81 to 1.00	0.73 to 0.90	0.65 to 0.80	0.57 to 0.70	0.49 to 0.60
	0.50	1.01 or more	0.91 or more	0.81 or more	0.71 or more	0.61 or more
<b>Levelness (percent) Spec – 0.5%</b>	1.00	0 to 0.30	0 to 0.28	0 to 0.26	0 to 0.24	0 to 0.22
	0.90	0.31 to 0.60	0.29 to 0.56	0.27 to 0.52	0.25 to 0.48	0.23 to 0.44
	0.80	0.61 to 0.90	0.57 to 0.84	0.53 to 0.78	0.49 to 0.72	0.45 to 0.66
	0.70	0.91 to 1.20	0.85 to 1.12	0.79 to 1.04	0.73 to 0.96	0.67 to 0.88
	0.60	1.21 to 1.50	1.13 to 1.40	1.05 to 1.30	0.97 to 1.20	0.89 to 1.10
	0.50	1.51 or more	1.41 or more	1.31 or more	1.21 or more	1.11 or more
<b>Joint Width (inches) Spec: 0.6 – 1.2 in.</b>	1.00	0 to 0.10	0 to 0.09	0 to 0.08	0 to 0.07	0 to 0.06
	0.90	0.11 to 0.20	0.10 to 0.18	0.09 to 0.16	0.08 to 0.14	0.07 to 0.12
	0.80	0.21 to 0.30	0.19 to 0.27	0.17 to 0.24	0.15 to 0.21	0.13 to 0.18
	0.70	0.31 to 0.40	0.28 to 0.36	0.25 to 0.32	0.22 to 0.28	0.19 to 0.24
	0.60	0.41 to 0.50	0.37 to 0.45	0.33 to 0.40	0.29 to 0.35	0.25 to 0.30
	0.50	0.51 or more	0.46 or more	0.41 or more	0.36 or more	0.31 or more
<b>Joint Offset (inches) Spec: 0.4 in.</b>	1.00	0 to 0.20	0 to 0.19	0 to 0.18	0 to 0.17	0 to 0.16
	0.90	0.21 to 0.40	0.20 to 0.38	0.19 to 0.36	0.18 to 0.34	0.17 to 0.32
	0.80	0.41 to 0.60	0.39 to 0.57	0.37 to 0.54	0.35 to 0.51	0.33 to 0.48
	0.70	0.61 to 0.80	0.58 to 0.76	0.55 to 0.72	0.52 to 0.68	0.49 to 0.64
	0.60	0.81 to 1.00	0.77 to 0.95	0.73 to 0.90	0.69 to 0.85	0.65 to 0.80
	0.50	1.01 or more	0.96 or more	0.91 or more	0.86 or more	0.81 or more

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02862S**

**SELECT MATERIAL FOR MSE WALLS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Select Material for MSE walls and placement procedures.

**1.2 RELATED SECTIONS**

- A. Section 02061: Select Aggregate.
- B. Section 02324S: Compaction.
- C. Section 02861S: Retaining Wall- Alternate Systems.
- D. Section 02833S: MSE Walls Using Concrete Facing Panels and Metal Reinforcing Elements.

**1.3 DEFINITIONS**

- A. Select Material for MSE Walls: Backfill material meeting requirements of Section 2.1.
- B. Gravel Backfill at Wall Face: Gravel backfill meeting requirements of Section 2.2.

**1.4 QUALITY ASSURANCE**

- A. Remove products found defective after installation and install acceptable products at no additional cost to the Department.

**PART 2 PRODUCTS**

**2.1 SELECT MATERIAL FOR MSE WALLS**



- A. Use Select Material for MSE wall backfill free from frozen, organic and otherwise deleterious materials. Conform to the following gradation limits as determined by AASHTO T-27:

**Table 1**

<b>Gradation for Select Material for MSE Walls</b>	
<b>Sieve Size</b>	<b>Percent passing</b>
4 inch*	100
No. 40	0 - 60
No. 200	0 - 15

\* Where geogrid reinforcement is used, 100 percent shall pass the  $\frac{3}{4}$ -inch sieve, unless the Contractor performs the following:

Make arrangements with the Wall Company to perform site and material specific installation damage testing with a representative sample of the proposed Select Material approved by the Engineer. Perform testing in accordance with the guidelines provided in Section's 4.5 and 5.1 of FHWA Publication No. FHWA-NHI-00-044. The installation damage reduction factor shall be as determined in the test, but no less than 1.2.

The Contractor bears all costs for performing the tests and certification of the test results by a registered engineer qualified in this subject/field. The Contractor is also responsible for any additional costs for the purchase of materials and/or construction of the wall based on the installation damage reduction factor obtained from the testing.

Additional material specific installation damage testing may be required at any time at the discretion of the Engineer, such as if the Engineer suspects a change in the Select Material characteristics from the original tested representative sample. The Contractor bears all costs for performing this additional testing and certification of the test results by a registered engineer. The Contractor is also responsible for any additional costs for the purchase of materials and/or construction of the wall based on the installation damage reduction factor obtained from the additional testing.

- B. Use Select Material with a Plasticity Index (PI), as determined by AASHTO T-90 of no greater than 6.
- C. Use Select Material with an internal friction angle of not less than 34 degrees as determined by the standard direct shear test, AASHTO T-236, utilizing a sample of the material compacted to 95 percent of AASHTO T-99, Methods C or D (with

Select Material for MSE Walls

oversize correction, as outlined in Note 7 of AASHTO T-99), at optimum moisture content. Internal friction angle testing is not required for backfill materials that have at least 80 percent of the material greater than or equal to the 3/4 inch size.

- D. Use Select Material that:
1. Is substantially free of shale or other soft, poor durability particles.
  2. Has a sodium sulfate soundness loss of less than 15 percent after 5 cycles, determined in accordance with AASHTO T-104.
  3. Has an organic content less than 1 percent as determined by AASHTO T-267 on the portion of the material finer than the No. 10 sieve.
- E. For wall systems using metallic reinforcement, use select material with the following electrochemical properties:

**Table 2**

<b>Electrochemical Requirements</b>		
Property	Requirement	Test Method
Resistivity	Minimum 3000 ohm-cm, at 100% saturation	AASHTO T-288
pH	Acceptable Range: 6.0 – 8.5	AASHTO T-289
Chlorides	Maximum 100 ppm	AASHTO T-291
Sulfates	Maximum 200 ppm	AASHTO T-290

- F. For wall systems using geosynthetic reinforcement (such as geogrid), use Select Material with a pH between 5.0 and 9.0, and a maximum of 200 ppm sulfates. However, no requirements for resistivity or chlorides are given for Select Material used for such geosynthetic systems.
- G. Furnish the Engineer with a Certificate of Compliance, from an AASHTO accredited testing lab, certifying that the Select Material complies with this section of the specifications. This certificate must be made by an AASHTO-certified testing lab.
- H. Furnish the Engineer with a copy of all test results performed to meet the requirements of this section of the specification.

## 2.2 GRAVEL BACKFILL AT WALL FACE

- A. Place Gravel Backfill along the wall face as per this Section, free from frozen, organic and otherwise deleterious materials, and conforming to the requirements for Free Draining Granular Backfill Borrow per Section 02061 M, except having a maximum particle size of  $\frac{3}{4}$  inch.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Excavation and Foundation Preparation:
  - 1. Excavate and grade foundation area to the lines and grades shown on the drawings, or as directed by the Engineer.
  - 2. Make the width of excavation equal to or exceeding the length of soil reinforcing elements.
  - 3. Prior to the wall construction, compact the foundation using a minimum of 3 passes of a light-weight, steel, smooth-drum vibratory roller, or as otherwise determined by the Engineer.
  - 4. Remove all foundation soils found to be unsuitable and replace with Select Material, placed and compacted as described in this Section, or with other suitable material determined by the Engineer.
- B. MSE Wall:
  - 1. Follow erection of each course of panels with placement of Select Material for MSE wall backfill. Complete backfill at the front of the wall prior to backfilling more than 4 feet above the bottom of the lowermost facing element.
  - 2. Do not damage or disturb wall materials or misalign facing panels during backfill placement.
  - 3. Remove and replace, or correct as directed by the Engineer, wall materials which become damaged or disturbed during backfill placement at no cost to the Department.
  - 4. Remove and replace, or correct as directed by the Engineer, Select Material placed which does not meet the requirements of this specification at no cost to the Department.
  - 5. Make the moisture content of the Select Material, prior to and during compaction, uniform throughout each layer.
  - 6. Determine the optimum moisture content in accordance with AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7 of T-99).
  - 7. Place Select Material with the moisture not greater than the optimum moisture content, nor less than 4 percentage points below optimum.
  - 8. Remove any Select Material with a placement moisture content in excess of the optimum moisture content. The wet Select Material backfill may be

Select Material for MSE Walls

- reused, provided it is aerated or otherwise reworked until the moisture content is uniform and acceptable throughout the entire lift.
9. Do not exceed 12 inches (loose) in lift thickness. Decrease the lift thickness as necessary to obtain the specified density. Place backfill in uniformly thick layers.
  10. Compact backfill to at least 95 percent of the maximum density, AASHTO T-99, Method C or D (with oversized correction, outlined in Note 7 of T-99).
  11. If 30 percent or more of the Select Material is greater than 3/4 inch in size, AASHTO T-99 is not applicable. For such a material, the acceptable criterion for control of compaction will be either a minimum of 70 percent relative density of the material, or as determined by a method specification (based on a test compaction section, which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content).
  12. When placing backfill over the soil reinforcement, begin placement 3 to 5 feet from the wall face and proceed away from the wall.
  13. In order to aid in locking the soil reinforcement into place, operate all compaction equipment parallel to the wall face, beginning at the back of the reinforced soil area and working towards the wall facing.
  14. Place and compact each layer of backfill in a level manner before placing subsequent backfill layers.
  15. Rubber-tired equipment may pass over the reinforcement only at slow speeds (less than 5 mph). Avoid sudden braking and sharp turning.
  16. Do not use sheeps-foot or other grid-type rollers for compacting material within the limits of the soil reinforcement.
  17. During the initial stage of wall construction, in order to avoid pushing the facing elements out of alignment, do not place or compact backfill against the facing elements until the first layer of soil reinforcement has been installed and one lift of Select Material has been placed and compacted over the reinforcement layer.
  18. For all subsequent layers of backfill, prior to placement of the reinforcement, place and compact the backfill to an elevation 2 inches above the reinforcement connection. Do this from a point approximately 18 inches behind the back face of the wall facings (panels, block units, etc.) to the end of the reinforcing, unless otherwise shown on the plans at specific locations.
  19. Achieve compaction within 3 feet of the back face of the wall facing units and within 2 feet of any obstructions, by at least three passes of a suitable lightweight or medium-weight (hand-held or hand-guided) mechanical roller, tamper, or vibratory compactor. Except when compacting a thin leveling lift along the reinforcement connections level, use compaction equipment with a static weight of less than 800 pounds within this zone. Use a maximum lift thickness within this zone as warranted by the type of compaction equipment actually used. Compact within this lighter equipment zone to within at least 3 inches of the facing elements. Exercise care in the compaction process to avoid misalignment of the

- facing elements.
20. Place Gravel Backfill within a zone behind the wall extending at least 30 inches from the front face of the wall facings (but a minimum of 12 inches in width). Place and compact the Gravel Backfill as described above for the lighter equipment zone.
  21. Use backfill placement and compaction methods to assure that no voids are present beneath the soil reinforcement elements prior to backfilling over the reinforcement, particularly near the facing elements.
  22. Place soil reinforcing elements normal to face of wall in plan view; or if necessary, skew elements (minimizing skew angle) to avoid obstructions, but no more than 15 degrees unless approved by the Wall Company.
  23. Do not proceed with the placement of each layer of soil reinforcement and overlying lift of backfill until the Engineer indicates and records that all backfill placement and compaction requirements (particularly in the 3-foot light-compaction zone) have been met.
  24. At the end of each day's operation, slope the backfill away from the wall to direct runoff of rainwater away from the wall face. Do not allow surface runoff from adjacent areas to enter the wall construction site.
  25. Place the top level of soil reinforcement parallel to the top of the facing unit a distance below the top of the wall as shown on the plans. Place the top level of soil reinforcement a minimum of 3 inches below the bottom of the barrier slab lip or the bottom of the concrete gutter behind the coping.
  26. Gradually deflect the upper reinforcement elements downward to avoid conflicts with paving and subgrade preparation. Pay particular attention to special conditions such as where roadway super-elevation is anticipated. Maximum deflection of the reinforcement elements is 8 inches, or as otherwise noted on the plans.
  28. Slope the top of the backfill along the wall such that the top reinforcement layer is covered with a minimum of 16 inches of Select Material.

**END OF SECTION**

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 02864S**

**MSE WALLS USING MODULAR BLOCK UNITS AND  
GEOGRID REINFORCING ELEMENTS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Furnish material and construct MSE walls using a wall system employing modular block units for the wall face, and geogrid reinforcing elements.
- B. Make arrangements to purchase the modular block wall units, geogrid reinforcement, joint filler, and all necessary attachments from the selected Wall Company.

**1.2 RELATED SECTIONS**

- A. Section 02861S: Retaining Wall- Alternate Systems
- B. Section 02862S: Select Material for MSE Walls
- C. Section 03055: Portland Cement Concrete
- D. Section 03211: Reinforcing Steel and Welded Wire
- E. Section 03310: Structural Concrete

**1.3 SUBMITTALS**

- A. Submit sample of the texture for approval by the Department.
- B. Submit to the Department for approval a minimum of 3 color samples of proposed segmental concrete unit colors, matched to colors of local features or as otherwise indicated, at least 4 weeks prior to beginning manufacture of the block units.
- C. Submit verification that the calculation of coefficient of lateral earth pressure is a factor of safety of 2.5 at the top of the wall as required by AASHTO.
- D. Provide verification that special design of the upper 10 feet of wall has been completed at locations where the design earthquake peak horizontal ground

acceleration coefficient is 0.30g or greater.

- E. Provide all other submittals required in Section 02861 S.
- F. Do not start work on any wall until working drawings have been reviewed by the Engineer. The Engineer's review of the Contractor's drawings does not relieve the Contractor of any responsibility under the contract for the successful completion of the work.

## **PART 2 PRODUCTS**

### **2.1 CONCRETE MODULAR BLOCK UNITS**

- A. Provide dry-cast concrete wall units having a minimum net 28-day compressive strength of 3000 psi. The maximum moisture absorption is 10 lb/ft<sup>3</sup>
- B. Concrete block shall be manufactured using a combination of cement, aggregates, admixtures, and other constituents which have been verified to be compatible with each other and with the environment in which the block is required to perform, including sulfate soils and/or groundwater.
- C. Cement shall meet the requirements of Section 03055.
- D. Pozzolan shall meet the requirements of Section 03055.
- E. Blended cement shall meet the requirements of Section 03055.
- F. Chemical admixtures shall meet the requirements of Section 03055.
- G. Provide coating to block faces with sealer to minimize chloride intrusion into units in accordance with Article 7.3.1.4 Division II of AASHTO 1999 *Interim Standard Specifications for Highway Bridges*.
- H. Normal weight aggregates shall meet the requirements of Section 03055.
- I. Lightweight aggregates, if used and approved, shall meet the requirements of ASTM C331.
- J. Provide block units with dimensions in conformance with the Wall Company's standard. Permissible variations are plus 1/8 inch and minus 1/16 inch.
- K. Provide block units having angled sides capable of producing concave and convex alignment curves with a minimum radius of 3.3 feet.
- L. Provide block units having a polymeric efflorescence control admixture.

- M. **Finish and Appearance:** All units shall be sound and free from cracks or other defects that would interfere with the proper placement of the unit, or significantly impair the strength or permanence of the construction. Minor cracks incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery are not grounds for rejection. The face or faces of units that are to be exposed shall be free of chips, cracks or other imperfections when viewed from a distance of 33 feet under diffused lighting. Up to five percent of a shipment may contain slight cracks or small chips not longer than 1 inch.
- N. Notify the Engineer in writing at least 72 hours before beginning the casting of concrete modular block units.
- O. **Sampling and Testing:** Acceptance of the concrete units with respect to compressive strength will be determined on a lot basis. The lot will be randomly sampled in accordance with ASTM Specification C 140. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupons provisions of Section 5.2.4 of ASTM Specification C 140.
  - 1. The rate of block sampling shall be:

**Table 1**

<b>Lot Size</b>	<b>Samples</b>
0-10,000	6 units
10,000-100,000	12 units
Greater than 100,000	6 units per 50,000

- 2. Provide additional samples if required by the Engineer.
- P. **Rejection:** Units shall be rejected because of failure to meet any of the requirements specified above. In addition, any or all of the following defects shall be sufficient cause for rejection:
  - 1. Defects that indicate imperfect molding;
    - a. Defects indicating honeycomb or open-texture concrete.
    - b. Cracked or severely chipped units.
    - c. Color variation on exposed face(s) of unit due to excess form oil or other reasons.

## **2.2 LEVELING PAD CONCRETE**

- A. Use Class A or B concrete as per Section 03055.



### **2.3 MODULAR BLOCK-UNIT FILL**

- A. Use free-draining crushed stone, predominantly 3/8 to 3/4 inch, with no more than 5 percent passing the No 200 sieve, within the modular block units requiring fill material.

### **2.4 GEOGRID**

- A. The geogrid shall consist of a regular grid network of integrally connected, discontinuous, select high-density polyethylene or polypropylene resin polymer tensile elements. Aperture geometry shall be sufficient to permit significant mechanical interlock with the surrounding soil and/or rock. The geogrid structure shall be dimensionally stable and be able to retain its geometry under manufacture, transport, and installation.
- B. Provide junction strength, minimum GRI-GG2 of 90 percent of ultimate strength.
- C. Provide maximum strain of 10 percent for tension creep test, 10,000 hours for 75-year design life, GRI-GG3.
- D. Provide ultimate strength, minimum GRI-GR1 as shown on plans.
- E. All soil reinforcement and attachment devices shall be carefully inspected to ensure they are true to size and free from defects that may impair their strength and durability.
- F. Prevent mud, wet concrete, epoxy and similar contaminants from coming in contact with and affixing to the soil reinforcement products.
- G. Store soil reinforcement products as recommended by the Wall Company.

### **2.5 FIBERGLASS PINS**

- A. Provide 1/2 inch diameter fiberglass connecting pins, where used, having a minimum flexural strength of 128 ksi and short beam shear of 6.5 ksi.

### **2.6 OTHER FASTENERS**

- A. Fasteners to wingwalls and abutment wall, if required, shall be provided by the selected Wall Company.

### **2.7 GEOTEXTILE**

- A. Horizontal and vertical joints between block units shall be covered by a geotextile of the type and grade as recommended by the Wall Company.

## **2.8 ADHESIVE**

- A. Per Wall Company's standard.

## **2.9 SELECT MATERIAL FOR WALL BACKFILL**

- A. See Special Provision Section 02862 S- Select Material for MSE Walls.

# **PART 3 EXECUTION**

## **3.1 GENERAL**

- A. Arrange for a qualified representative (minimum 5 years experience with MSE wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the entire wall(s), including being at the project site during all phases of wall construction. The Wall Company shall provide assurance that the completed wall(s) meet all Department and Wall Company specifications. Note: Where the Department's and the Wall Company's specifications differ, the stricter of the two shall be applied. The representative is responsible for training the Contractor and/or Department inspectors in proper quality control for construction of the walls. The Wall Company representative shall report any irregularities to the Engineer.
- B. Haul, store and ship wall materials so as to minimize the potential of producing any type of defects.
- C. Perform excavation and foundation preparation (including removal of unsuitable soils) as described in Section 02862 S.
- D. Construct the wall system in accordance with the approved plans, this specification, and the Wall Company's recommendations and construction manual.

## **3.2 LEVELING PAD**

- A. Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings, to ensure complete contact of the retaining wall units with the base.
- B. Place cast-in-place concrete leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill as per Section 02862 S. Place leveling pad to a minimum thickness of 6 inches.

- C. Allow leveling pad to cure for at least 12 hours prior to placing concrete panels.
- D. Use rubber, wood, or metal shims as necessary to make final adjustments to the wall panel to facilitate level placement of the panel.

### **3.3 MODULAR BLOCK UNIT INSTALLATION**

- A. Place wall backfill as described in Section 02862 S.
- B. Place the first course of modular block units on the leveling pad. Check the wall units for level and alignment. The first course is the most important to ensure accurate and acceptable results.
- C. Ensure block units are in full contact with the leveling pad.
- D. Install connecting devices in block units as required by the Wall Company.
- E. For block units requiring fill material, fill all voids in block units with modular block unit fill. Tamp fill. Ensure each wall course is completely filled, backfilled, and compacted prior to proceeding to the next wall course.
- F. Where connecting pins are used, lay up each course ensuring connecting pins protrude into adjoining courses above a minimum of 1 inch.
- G. Pull each block unit forward, away from the embankment, against connecting devices in the previous course and backfill as the course is completed. Repeat procedure to the extent of the wall height.
- H. As appropriate where the wall changes elevation, the units can be stepped with grade or turned into the embankment with a convex return end. Provide appropriate buried units on the compacted leveling pad in the area of the convex return end.
- I. Horizontal tolerance shall be +/- 1½ inches in 30 feet (3 inches overall). Vertical tolerance shall be ¾ inch when measured along a 10-foot straight edge. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed 1 ½ inch per 20 feet of wall height. Levelness tolerance shall be 5/8 inch per 10 feet.
- J. All joints shall be uniform. During construction the maximum allowable offset in any block joint shall be ¼ inch. Joint width shall be ½ inch maximum and 1/8 inch minimum.

### **3.4 GEOGRID INSTALLATION**

- A. Verify the correct orientation (roll direction) of the geogrid.
- B. Lay the geogrid soil reinforcement horizontally on the compacted backfill at the

proper elevations as designed.

- C. Connect geogrid to the concrete wall units as required by Wall Company.
- D. Pull the geogrid taut to eliminate loose folds and removing slack in the geogrid at the wall unit connections, pretension the geogrid, and then stake or otherwise secure the back edge of the geogrid before and during backfill and compaction.
- E. Follow the Wall Company's guidelines relative to overlap requirements of uniaxial and biaxial geogrids.
- F. Assuming reinforcement layers must be partially or fully served in the location of an obstruction (such as a caisson foundation, guardrail post, catch basin, drop inlet, or culvert), in the wall soil reinforcement zone, reinforcement design shall be modified using one of the following two alternatives:
  - 1. Design the surrounding reinforcement layers to carry the additional load which would have been carried by the severed reinforcement.
  - 2. Place a structural frame around the obstruction which is capable of transferring loads from the reinforcements on one side of the obstruction to reinforcements on the other side of the obstruction.

### **3.5 WALL Coping INSTALLATION**

- A. Provide a permanent connection between the wall coping and the top course of the wall units. Construct according to the wall company drawings and specifications.

### **3.6 SAMPLING AND TESTING**

- A. Certificates of Compliance. Furnish to the Engineer copies of the certificate of compliance for materials and the results of any tests run on them from the Wall Company on the materials.
- B. Select Material Density Testing. The Engineer will make at least one density determination per lift for each 100 feet of retaining wall. The tests will be made at random locations; but will be at least 3 feet from back of wall.
- C. Concrete Testing. Strength, slump, air, and yield tests will be conducted in accordance with Section 03055.

### **3.7 BLOCK UNITS ACCEPTANCE**

- A. Meet 28-day compression test. Block units which meet 75 percent of 28-day strength within 7 days are acceptable for placement in the wall.
- B. No block units shall be placed in the wall unit until it has been cured for a minimum

of 7 days.

- C. All block units shall be visually free of defects.
- D. Submit certificate of compliance to the Engineer.

**END OF SECTION**

**SPECIAL PROVISION**

**PROJECT # STP-3328(1)0**

**SECTION 02926S**

**INVASIVE WEED CONTROL**

**Add Section 02926:**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Controlling the spread of noxious weeds.

**1.2 DEFINITIONS**

- A. Noxious weeds subject to control are listed on the Utah State Noxious Weed List and the county's weed list that applies based on the project location. Refer to Article 3.3 of this Section for a list of the Utah State Noxious Weeds and the noxious weeds for each Utah county.

**1.3 PAYMENT PROCEDURES**

- A. Include payment for cleaning earthmoving construction equipment under mobilization.
- B. Pay for the control of invasive weeds using pre-emergent, selective, and non-selective herbicides by the unit area.

**1.4 QUALITY ASSURANCE**

- A. Regulatory Requirements:
  - 1. Follow all regulatory, application, and safety precautions listed by the herbicide manufacturer.
  - 2. Apply herbicides using only state licensed pesticide applicators.

**1.5 SEQUENCING**

- A. Clean all earth moving equipment before bring them on the project.

- B. Treat existing noxious weeds 10 days before starting earthwork operations.

## **PART 2 PRODUCTS**

### **2.1 HERBICIDE**

- A. Refer to Article 3.3 of this Section for a list of noxious weeds subject to control and the recommended herbicide for each species.
- B. Use commercially available herbicides specified to control weed species identified.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Use high-pressure water blasting or steam cleaning methods to clean all earthmoving construction equipment (scrapers, bulldozers, excavators, backhoes, trenchers) of dirt, mud and seed residue before initially entering the project.

### **3.2 EXAMINATION**

- A. Verify and locate all noxious weeds on the project. If assistance is needed for identification, contact the county weed control supervisor or UDOT's region landscape architect.

### **3.3 CONTROLLING INVASIVE WEEDS**

- A. Control invasive weeds. Use pre-emergent, selective, and non-selective herbicides as appropriate (See chart below). Apply herbicide as directed on the manufacturer's label.

## B. Noxious Weed Table:

<b>Utah State Noxious Weeds</b>		
Common Name	Scientific Name	Herbicide
Bermudagrass*	<i>Cynodon dactylon</i>	glyphosate
Bindweed	<i>Convolvulus spp.</i>	Dicamba+2,4-d or picloram
Broad-leaved Peppergrass	<i>Lepidium latifolium</i>	metsulfuron or chlorsulfon
Canada Thistle	<i>Cirsium arvense</i>	2,4-D, dicamba, picloram
Diffuse Knapweed	<i>Centaurea diffusa</i>	2,4-D+dicamba or picloram or clopyralid
Dyers Woad	<i>Isatis tinctoria</i>	2,4-D+dicamba or chlorsulfuron
Perennial Sorghum spp (Johnsongrass)	<i>Sorghum halepense, Sorghum Almun</i>	glyphosate
Leafy Spurge	<i>Euphorbia esula</i>	dicamba or picloram
Medusahead	<i>Taeniatherum caput-medusa</i>	glyphosate
Musk Thistle	<i>Carduus nutans</i>	2,4-D amine, metsulfuron or picloram
Purple Loosestrife	<i>Lythrum salicaria</i>	glyphosate (Rodeo Aquatic label)
Quackgrass	<i>Agropyron repens</i>	Glyphosate
Russian Knapweed	<i>Centaurea repens</i>	Picloram or clopyralid or chlorsulfuron
Scotch Thistle	<i>Onopordium acanthium</i>	2,4-D amine, metsulfuron or picloram
Spotted Knapweed	<i>Centaurea maculosa</i>	2,4-D+dicamba, picloram or clopyralid
Squarrose Knapweed	<i>Centaurea squarrosa</i>	Picloram
Whitetop	<i>Cardaria spp</i>	2,4-D+dicamba or chlorsulfuron
Yellow Starthistle	<i>Centaurea solstitialis</i>	picloram or clopyralid
*Do not consider Bermudagrass ( <i>Cynodon dactylon</i> ) a noxious weed in Washington County		
<b>County Noxious Weeds</b>		
<b>Cache County</b>		
Common Name	Scientific Name	Herbicide
Goatsrue	<i>Galega officinalis</i>	2,4-D+dicamba
Poison Hemlock	<i>Conium maculatum</i>	2,4-D+dicamba
Puncture Vine	<i>Tribulus terrestris</i>	2,4-D+dicamba



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<b>Carbon County</b>		
Common Name	Scientific Name	Herbicide
Russian Olive	<i>Elaeagnus angustifolia</i>	2,4-D, dicamba, or glyphosate
<b>Davis County</b>		
Common Name	Scientific Name	Herbicide
Poison Hemlock	<i>Conium maculatum</i>	2,4-D+dicamba
Buffalobur	<i>Solanum rostratum</i>	2,4-D+dicamba
Yellow Nutsedge	<i>Cyperus esculentus</i>	glyphosate
<b>Duchesne County</b>		
Common Name	Scientific Name	Herbicide
Russian Olive	<i>Elaeagnus angustifolia</i>	2,4-D, dicamba, or glyphosate
<b>Grand County</b>		
Common Name	Scientific Name	Herbicide
Purple Loosestrife	<i>Lythrum salicarial</i>	glyphosate (Rodeo Aquatic label)
<b>Juab County</b>		
Common Name	Scientific Name	Herbicide
Water Hemlock	<i>Cicuta maculata</i>	2,4-D, or dicamba
<b>Kane County</b>		
Common Name	Scientific Name	Herbicide
Poison Hemlock	<i>Conium maculatum</i>	2,4-D+dicamba
<b>Rich County</b>		
Common Name	Scientific Name	Herbicide
Black Henbane	<i>Hyoscyamus niger</i>	2,4-D+metsulfuron
<b>San Juan County</b>		
Common Name	Scientific Name	Herbicide
Silverleaf Nightshade	<i>Solanum elaeagnifolium</i>	Imazapyr or glyphosate
Buffalobur	<i>Solanum rostratum</i>	2,4-D or dicamba
Whorled Milkweed	<i>Asclepias subverticillata</i>	2,4-D or dicamba
<b>Sanpete County</b>		
Common Name	Scientific Name	Herbicide
Houndstonge	<i>Cynoglossum officinale</i>	2,4-D or dicamba

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<b>Uintah County</b>		
Common Name	Scientific Name	Herbicide
Russian Olive	<i>Elaeagnus angustifolia</i>	2,4-D, dicamba, or glyphosate
Purple Loosestrife	<i>Lythrum salicarial</i>	glyphosate (Rodeo Aquatic label)
<b>Washington County</b>		
Common Name	Scientific Name	Herbicide
Poison Milkweed	<i>Asclepias subverticillata</i>	2,4-D, or dicamba
<b>Weber County</b>		
Common Name	Scientific Name	Herbicide
Puncture Vine	<i>Tribulus terrestris</i>	2,4-D+dicamba
<b>Use rates:</b> Use rates for herbicides vary, follow the use rate on the LABEL for each herbicide		

END OF SECTION

**SPECIAL PROVISION**

**SECTION 02969S**

**OPTIONAL USE OF RECLAIMED ASPHALT PAVEMENT**

**Delete section 02969 in their entirety and replace with the following:**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Option to incorporate Reclaimed Asphalt Pavement (RAP) materials into hot mix asphalt pavement, dense-graded material only.

**1.2 RELATED SECTIONS**

- A. Section 02741: Hot Mix Asphalt (HMA)
- B. Section 02745: Asphalt Materials

**1.3 REFERENCES**

- A. AASHTO M 320: Performance Graded Asphalt Binder
- B. AASHTO T 164: Quantitative Extraction of Bitumen from Paving Mixtures
- C. AASHTO T 170: Recovery of Asphalt from Solution by Abson Method
- D. UDOT Materials Manual of Instruction
- E. UDOT Minimum Sampling and Testing Guide

**1.4 SUBMITTALS**

- A. Quality Control Plan.
  - 1. Submit the proportion of materials from each of the RAP stockpiles intended to be used in the project.
  - 2. Submit the sampling and testing plan for the project.
  - 3. Provide for testing, by an AMRL accredited laboratory, of the reclaimed material and the total mixture at no additional cost to the Department.
  - 4. Submit to the Engineer for approval.

## **PART 2      PRODUCTS**

### **2.1      PG BINDER**

- A.      Select and supply a standard AASHTO M 320 PG Binder meeting the requirements of Sections 02745 and Section 509 of the UDOT Minimum Sampling and Testing Guide: Asphalt Binder Quality Management Plan, in accordance to Table 1.
- B.      Perform Department Quality Assurance testing on the supplied grade of standard PG Binder in accordance to Section 509.

### **2.2      MIX DESIGN**

- A.      Obtain Engineer's approval for the use of RAP in the hot mix asphalt.
- B.      Use up to 30 percent RAP by total weight in the hot mix asphalt, in accordance to Table 1.
- C.      Provide the following for each RAP Stockpile:
  - 1.      Extracted Gradation
  - 2.      Asphalt Content
  - 3.      SSD Specific Gravity of Extracted RAP
- D.      Provide the following for the RAP Material combined in proportions for the intended production of HMA:
  - 1.      Performance Grade of recovered asphalt binder.
    - a.      Use AASHTO T 164, Method E, with reagent grade Trichloroethylene, and AASHTO T 170 to recover the asphalt binder.
    - b.      Determine the performance grade of the recovered binder in accordance to AASHTO M 320 with the following modification:
      - (1)      PAV aging is not required before testing for fatigue and low temperature cracking.
- E.      Select the percentage of RAP by total weight in the hot mix asphalt and the standard, virgin asphalt binder grade meeting Section 02745, using Table 1:

**Table 1**  
**Binder Selection Guidelines and Total Allowable RAP for RAP Mixtures**

<b>Recovered RAP Asphalt Binder Grade</b>	<b>Desired RAP Percent</b>	<b>Recommended Virgin Asphalt Binder Grade</b>
PGXX-22 or lower	< 20 percent	No Change in the Design Grade of the Asphalt Binder
	20 -30 percent	Select Virgin Binder one grade softer than normal (e.g. select a PG64-34 if a PG70-28 is the design grade*)
PGXX-16	< 15 percent	No Change in the Design Grade of the Asphalt Binder
	15 - 25 percent	Select Virgin Binder one grade softer than normal (e.g. select a PG64-34 if a PG70-28 is the design grade*)
PGXX-10 or higher	< 10 percent	No Change in the Design Grade of the Asphalt Binder
	10 - 15 percent	Select Virgin Binder one grade softer than normal (e.g. select a PG64-34 if a PG70-28 is the design grade*)

\* Do not select any grades lower than PG XX-34.

- F. Meet all the requirements of Section 02741 and the following:
  - 1. Average wheel impression not to exceed 10 mm in 20,000 passes when tested in accordance with Hamburg Wheel Track Testing of Compacted Bituminous Mixtures, UDOT Materials Manual of Instruction Section 990.
    - a. Provide to UDOT Central Laboratory sufficient mix to preform test. Allow ten days for results.
  - 2. Meet all the requirements of Aggregate Properties of Section 02741 for the virgin aggregate portion of combined virgin and RAP aggregate.
- G. Complete the mix design for the combined virgin and RAP materials following Superpave volumetric mix design procedures. Use an AMRL accredited laboratory for the design.
- H. Provide the following for the combined virgin and RAP materials:
  - 1. Gradation
  - 2. Asphalt content
  - 3. RAP content

## **PART 3      EXECUTION**

### **3.1      RECLAIMED MATERIAL**

- A.      Crush or screen the reclaimed material to be used for recycle to pass a 1-1/2 inch sieve.
  - 1.      Construct stockpile platforms in such a way to prevent intrusion of subgrade materials into RAP.
  - 2.      Provide adequate drainage for the stockpile site.
  - 3.      Use separate cold feed bins for each stockpile.
  - 4.      Use screened reclaimed material free of organic materials, soil, or other foreign substances.

END OF SECTION

September 1, 2005

**SPECIAL PROVISIONS**

**PROJECT # STP-3328(1)0**

**SECTION 03300S**

**CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete form work.
- B. Floors and slabs on grade.
- C. Concrete foundation walls and vaults.
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads, thrust blocks, and other miscellaneous items.
- G. Concrete curing.

**1.02 MEASUREMENT AND PAYMENT**

- A. Concrete for Miscellaneous Structures.
  - 1. Basis for Measurement: concrete and reinforcement for miscellaneous structures and other work shall be made and included in the unit price and lump sum price bid for the miscellaneous items of work.
  - 2. Basis for Payment: Includes form work, reinforcement, concrete, placement, accessories, consolidating and leveling, curing and finishing.
- B. Concrete - Grouting.
  - 1. Basis for Measurement: grouting for miscellaneous structures and other work shall be made and included in the unit price and lump sum price bid for the miscellaneous items of work.
  - 2. Basis for Payment: Includes preparation of substrate, grout, placement, consolidating, troweling, and curing.

### 1.03 REFERENCES

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 1996.
- C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 1989.
- D. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 1991.
- E. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 1988.
- F. ACI 308 - Standard Practice for Curing Concrete; American Concrete Institute International; 1992.
- G. ACI 309R - Guide for Consolidation of Concrete; American Concrete Institute; 1992.
- H. ACI 318 - Building Code Requirements for Reinforced Concrete and Commentary; American Concrete Institute International; 1995.
- I. ACI 347 - Guide to Form work for Concrete; American Concrete Institute; 1992.
- J. ASTM A 185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement; 1997.
- K. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 1996a.
- L. ASTM C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- M. ASTM C 33 - Standard Specification for Concrete Aggregates; 1997.
- N. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 1996.
- O. ASTM C 94 - Standard Specification for Ready-Mixed Concrete; 1997.
- P. ASTM C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
- Q. ASTM C 150 - Standard Specification for Portland Cement; 1997.



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- R. ASTM C 171 - Standard Specification for Sheet Materials for Curing Concrete; 1997.
- S. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 1994a.
- T. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete; 1995.
- U. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 1997.
- V. ASTM C 494 - Standard Specification for Chemical Admixtures for Concrete; 1992.
- W. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete; 1997.
- X. ASTM C 881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 1990.
- Y. ASTM C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 1997.
- Z. ASTM C 1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete; 1995.
- AA. ASTM D 994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 1994.
- AB. ASTM D 1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 1983 (reapproved 1991).
- AC. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinyl chloride Waterstop; Corps of Engineers; 1974.

### **1.04 SUBMITTALS**

- A. See Section 01300S - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products.
- C. Samples: Submit one, four inch long samples of waterstops and construction joint devices, as directed.
- D. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.

- E. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

## **1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Acquire cement from same source and aggregate from same source for entire project.
- C. Follow recommendations of ACI 305R when concreting during hot weather.
- D. Follow recommendations of ACI 306R when concreting during cold weather.

## **PART 2 PRODUCTS**

### **2.01 FORM WORK**

- A. Form Materials: Contractor 's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
  - 1. Form Facing for Exposed Finish Concrete: Contractor 's choice of materials that will provide smooth, stain-free final appearance.
  - 2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
  - 3. Form Ties: Snap-Off type that will leave no metal within 1-1/2 inches of concrete surface. Use of tie wire as form ties will not be permitted.

### **2.02 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
  - 1. Deformed billet-steel bars.
  - 2. Unfinished.
- B. Welded Steel Wire Fabric: ASTM A 185, plain type.
  - 1. Coiled Rolls or flat sheets.
  - 2. Mesh Size and Wire Gage: As indicated on drawings.
- C. Reinforcement Accessories:
  - 1. Tie Wire: Annealed, minimum 16 gage.
  - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
  - 3. Provide galvanized or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

## **2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C 150, Type IIA - Air Entraining Portland type.
- B. Cement: ASTM C 150, Type V - Sulfate Resistant Portland type. when exposed to sewage.
- C. Fine and Coarse Aggregates: ASTM C 33.
- D. Fly Ash: ASTM C 618, Class F.
- E. Calcined Pozzolan: ASTM C 618, Class N.
- F. Water: Clean and not detrimental to concrete.
- G. Synthetic Fiber Reinforcement: Comply with ASTM C 1116; 1/2 inch length.

## **2.04 ADMIXTURES**

- A. Air Entrainment Admixture: ASTM C 260.
- B. Chemical Admixtures: ASTM C 494, Type D - Water Reducing and Retarding.
  - 1. Provide products manufactured by Sika Chemical Corporation or acceptable equal.

## **2.05 CONCRETE ACCESSORIES**

- A. Epoxy Bonding System: ASTM C 881, type as required by project conditions.
- B. Non-Shrink Grout: ASTM C 1107; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
  - 1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
  - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
- C. Moisture-Retaining Cover: ASTM C 171; clear polyethylene or white burlap-polyethylene sheet.
- D. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent.

## **2.06 JOINT DEVICES AND MATERIALS**

- A. Waterstops: PVC type, COE CRD-C 572.
- B. Joint Filler: ASTM D 1751; Asphalt impregnated fiberboard or felt, 1/2 inch thick; tongue and groove profile.

## **2.07 CONCRETE MIX DESIGN**

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- C. Fibrous Reinforcement: Where indicated, add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.
- D. Normal Weight Concrete:
  - 1. Compressive Strength, per ASTM C 39 at 28 days: 4,000 psi.
  - 2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
  - 3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
  - 4. Cement Content: Minimum 592.2 lb. per cubic yard; 6.3 bag mix.
  - 5. Water-Cement Ratio: Maximum 48 percent by weight.
  - 6. Total Air Content: 4 to 8 percent for concrete exposed to freezing and thawing; and 2 to 4 percent for other concrete; per ASTM C 173.
  - 7. Maximum Slump: 4 to 2 inches for structures; 3 to 1 1/2 inches for blocks and pavement.
  - 8. Maximum Aggregate Size: one inch.

## **2.08 MIXING**

- A. Transit Mixers: Comply with ASTM C 94.
- B. During hot weather or under other conditions contributing to rapid setting of concrete, mixing times will be reduced as follows:
  - 1. When air temperature is between 85 and 90 degrees (F), reduce mixing time and delivery time from 90 minutes to 75 minutes.
  - 2. When air temperature is above 90 degrees (F), reduce mixing time and delivery time to 60 minutes.
- C. Provide batch ticket for each batch used in the work. Ticket shall indicate project identification name and number, date, mix type, mix time, quantity, and amount of water added.

## **PART 3 EXECUTION**

### 3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### 3.02 PREPARATION

- A. Form work: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Forms shall be mortar tight, properly aligned, as indicated, to produce concrete surfaces meeting the surface requirements specified herein.
- C. Forms shall be constructed so they can be removed without hammering on or prying against concrete, and without damaging concrete in any way.
- D. Verify that forms are clean before applying release agent.
- E. Coordinate placement of joint devices with erection of concrete form work and placement of form accessories.
- F. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- G. In locations where new concrete is doweled to existing work, drill holes in existing concrete, fill holes with epoxy bonding agent, and insert steel dowels.
- H. The Engineer's review of form work will not relieve the Contractor from any responsibility as to the adequacy of the form work, shoring and bracing design. All form work installed by the Contractor shall be solely at his risk. The Engineer's review will not lessen or diminish the Contractor's liability.
- I. Alignment and Tolerances. Form work shall be designed and constructed so that concrete surfaces of finished structures will comply with the tolerances specified in ACI 347; and will conform to the following:
  - 1. Vertical Alignment: maximum allowable variation, from bottom to top of a wall, is plus or minus 3/8 inch.
  - 2. Plumb: maximum allowable variations as follows:
    - a. In plumb and surfaces of columns and walls is plus or minus 1/4 inch in any 10-feet of length; and a maximum of one-inch for entire length.
    - b. In plumb for exposed corner, control-joint grooves, or other conspicuous lines is plus or minus 1/4 inch in any 20-feet of length; and a maximum of 1/2-inch for the entire length.
  - 3. Wall Thickness: shall not vary more than minus 1/8 inch or plus 1/2 inch.
  - 4. Level or Grade: maximum variation from level or grade indicated shall not exceed plus or minus 1/4 inch in any 10-feet of length; or plus or minus 3/8-inch in any 20-

feet of length.

5. Distance: maximum variation in distance between walls, columns, or other members shall not exceed plus or minus 1/4 inch in any 10-feet of length; and not more than one-inch total variation.

### **3.03 INSTALLING REINFORCEMENT**

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install wire fabric in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

### **3.04 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Engineer not less than 24 hours prior to commencement of placement operations. No concrete shall be placed until all form work, construction joints, reinforcing steel, and other items have been completed and accepted by the Engineer.
- D. Before placing concrete, inspect and complete form work installations, reinforcing steel placement, and items to be embedded or cast-in.
- E. Notify other crafts involved in ample time to permit installation of their work; cooperate with other trades in setting such work.
- F. All dirt, chips, sawdust, debris, mud, water and other foreign matter shall be removed from within forms or within excavated areas adjacent to forms before any concrete is placed.
- G. Ensure reinforcement, inserts, water stops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- H. Separate slabs on grade from vertical surfaces with 1/4 inch thick joint filler.
- I. Install joint devices in accordance with manufacturer's instructions.

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- J. Concrete shall be conveyed from mixer to forms as rapidly as possible within specified time limits; and by methods that will prevent segregation of concrete mix.
- K. Concrete shall be placed within 15 minutes after it has been discharged from mixer.
- L. Provide adequate equipment and labor for conveying concrete to ensure a continuous flow of concrete at delivery point.
- M. Concrete shall be deposited as close as possible to its final position in the forms; there shall be no vertical drop greater than 8 feet, except where suitable equipment is provided to prevent segregation of concrete and where specifically authorized.
- N. Deposit concrete so that it will be effectively consolidated in horizontal layers not more than 12 inches thick; except that all slabs shall be placed in single layer.
- O. Where placement consists of several layers, place each layer while the preceding layer is still plastic to avoid cold joints, and within 30 minutes after placement of preceding layer.
- P. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- Q. Place concrete continuously between predetermined expansion, control, and construction joints.
- R. Do not interrupt successive placement; do not permit cold joints to occur.
- S. Do not use concrete which becomes non-plastic or unworkable, does not meet the required quality control limits, or which has become contaminated by foreign materials. Do not use re-tempered concrete. Remove rejects concrete from the project site and dispose of in an acceptable manner.
- T. Place floor slabs in checkerboard or saw cut pattern indicated.
- U. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- V. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.
- W. Concrete shall not be placed in water; nor shall water be allowed to rise over freshly placed concrete until the concrete has set sufficiently to prevent its being damaged thereby.

### 3.05 CONSOLIDATING

- A. Consolidate each layer of concrete immediately after placement with internal vibrators in accordance with ACI 309, except for slabs 4 inches thick or less.
- B. Vibrators shall be inserted vertically at uniform spacing over entire area of placement; spacing to be approximately 1-1/2 times radius of action of vibrator. Vibrators shall penetrate rapidly to bottom of layer being placed, and at least 6 inches into the preceding layer.
- C. Vibrators shall be supplemented by hand spading adjacent to forms on exposed surfaces. Concrete shall be compacted and well worked into all corners and angles in forms, and around reinforcement and embedded items.

### **3.06 FORM REMOVAL**

- A. Forms shall be removed in a manner that will prevent damage to concrete and ensure complete safety of the structure.
- B. Forms shall not be removed until approval is given by the Engineer.
- C. Form work for columns, walls and other members not supporting weight of concrete may be removed when concrete has attained sufficient strength to resist damage from removal operation; but not before at least 48 hours after concrete placement.
- D. Form work for columns, walls, roof slabs, and other members supporting weight of concrete may not be removed until concrete has attained sufficient strength to carry imposed loads as determined by compression tests, and when directed by the Engineer.

### **3.07 CONCRETE FINISHING**

- A. Repair and patch surface defects, including tie holes, on all surfaces immediately after removing form work.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
  - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
  - 2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  - 1. Wood float surfaces that will receive trowel finish or other finishes, as indicated.



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2. Steel trowel surfaces that will be left exposed.
  3. Broom finish exterior concrete to provide non-slip finish.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:50 nominal.
- F. All exposed edges to be chamfered; 3/4 inches minimum.

### **3.08 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
1. Normal concrete: Not less than 7 days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-fog spray, or saturated burlap, as acceptable to the Engineer.
  2. Begin final curing after initial curing but before surface is dry.
    - a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.
    - b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

### **3.09 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design to engineer and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C 39. For each test, mold and cure three concrete test cylinder. Obtain test samples for every 50 cu yd or less of concrete placed.
- F. Take two additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

- G. Perform one slump test for each load at point of discharge; and perform slump test with each set of test cylinders taken.
  - 1. If maximum slump for the application is exceeded, it will be assumed that the water content is excessive and the load shall be rejected.
  - 2. If slump is less than the minimum for the application, a measured quantity of water may be added to the mix; quantity shall not exceed 1/6 gallon of water per bag of cement.
  - 3. Water shall be added only in the presence of the Engineer and after a slump test has been made.
  - 4. If concrete has been mixed for more than one hour, the loss of slump shall be considered as being caused by setting of concrete; water shall not be added, and the load shall be rejected.
- H. Perform test to determine air content in accordance with ASTM C 231; a minimum of one test shall be done each time a slump test is made. Air content shall be within specified limits.

### **3.10 DEFECTIVE CONCRETE**

- A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

### **3.11 SCHEDULE - CONCRETE TYPES AND FINISHES**

- A. Structure Not Exposed to View: 4,000 psi 28 day concrete; form finish surface, with honeycomb and holes filled and repaired.
- B. Exposed Structures: 4,000 psi 28 day concrete; air entrained, smooth rubbed finish.

END OF SECTION.

**Supplemental Specification  
2005 Standard Specification Book**

**SECTION 13554M**

**POLYMER CONCRETE JUNCTION BOX**

**Delete Article 2.2 and replace with the following:**

**2.2 JUNCTION BOXES AND LIDS**

- A. Provide junction boxes and vaults that resist water absorption in accordance with ASTM D 570.
- B. Select Junction Boxes for load rating as defined on AT series Standard Drawings as follows:
  - 1. Load Rating 1: Incidental Vehicular Traffic
    - a. In any paved area immediately adjacent to the mainline, such as shoulders, snow storage areas, or vehicle pullout areas, provide boxes, rings, and lids that sustain a minimum vertical test load of 33,500 lbs over a 10-inch x 20-inch square.
  - 2. Load Rating 2: Non-wheel Loading Accessible
    - a. In area not in traveled way, provide boxes, rings, and lids that sustain a minimum vertical test load of 22,500 lbs over a 10-inch x 20-inch square.
- C. Provide a poured-in-place 1-inch thick grout floor, with a 1-inch diameter drain, for all type I, II, and III-Polymer Concrete Junction Boxes or a box with a prefabricated floor with a 1-inch drain hole. Refer to ASTM C 579 and ASTM C 580 for test methods for grout.
- D. Provide lid for all junction boxes as specified by application.
- E. Provide lids with a non-skid surface with minimum coefficient of friction of 0.50, per ASTM C 1028. Coatings will not be approved.

- F. Manufacture lids with the following markings in the logo area, in 1-inch recessed letters:
  - 1. "Traffic Signal" when the junction box contains cables or wires for traffic signal (Refer to Section 02892), CCTV, VMS, RWIS, WIM, ramp meter, traffic monitoring, or any other ATMS element (Refer to Section 13551).
  - 2. "Electric" when the junction box contains power conductors used for traffic signal, CCTV, VMS, RWIS, WIM, ramp meter, traffic monitoring, or any other ATMS element.
  - 3. "Street Lighting" when the junction box contains street lighting conductors only. Inscribe "High Voltage" below the words "Street Lighting" when the junction box contains voltage above 600 V.
  - 4. "Communication" when the junction box contains multi-duct conduit for future use.
  - 5. "Sprinkler Control" when sprinkler control conduit enters the junction box.
- G. Provide lids with recessed access point to allow removal of cover with a hook or lever. Repair damage to the pulling point in the lid.
- H. Provide lids with vandal-resistant stainless steel recessed bolts.

**Delete Article 3.1 paragraph H through N and replace with the following:**

- H. Install bushings on end of all conduit prior to cable installation.
- I. Do not install conduit in corner of junction box or within 2 inches of corner of junction box. Extend conduit 2 inches beyond the inside wall of the junction box. Refer to AT series Standard Drawings.
- J. Enter conduit through the sides of the junction box and not from the bottom. Place the conduit at least three inches above the floor.
- K. Place the recessed access point in a location that provides both leverage and safety.
- L. Saw cut concrete or other improved surfaces that require removal in the sidewalk area. Remove entire section of sidewalk. Replace with in-kind materials to match the existing grade.
- M. Provide 12 inches deep free draining granular backfill borrow (Refer to Section 02061) directly under junction box.

- N. Install Engineer approved expansion joint material around entire periphery of ring for junction boxes installed in paved surface.